

MARINE REVIEW.

VOL. XIII.

CLEVELAND, O., JANUARY 16, 1896.

No. 3.

New Revenue Cutters.

The treasury department will evidently do all in its power to secure the passage of Senator Cullom's bill providing for an appropriation of \$400,000 with which to build two revenue cutters for the lakes in addition to the one now under construction in Cleveland. In a letter to Senator Cullom, Mr. C. S. Hamlin, the assistant secretary, says:

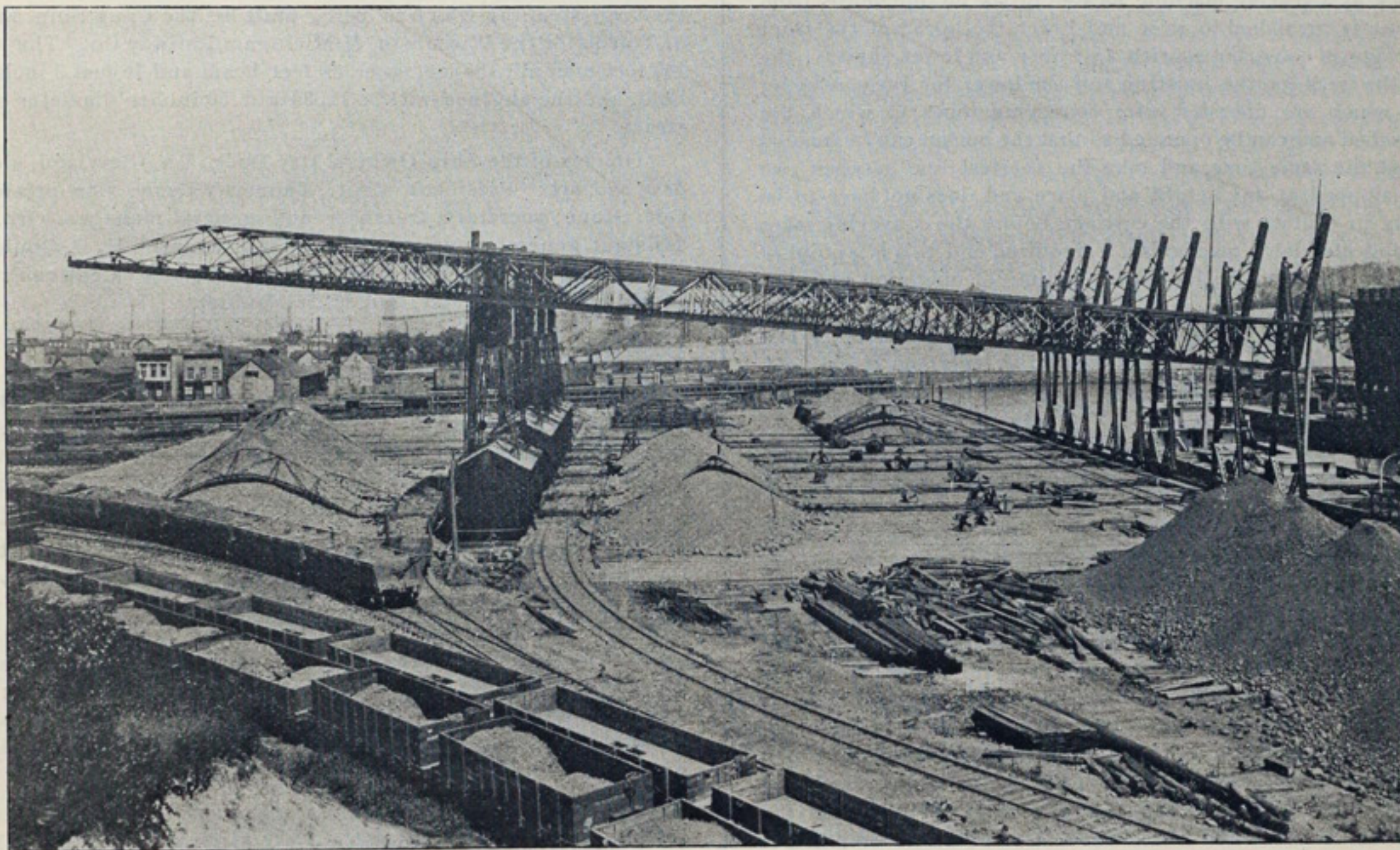
"It is the opinion of the department that at least two revenue cutters, additional to the one now being constructed at Cleveland, should be provided for service on the great lakes. In view of the large advance in the price of material entering into the construction of iron and steel vessels, the sum of \$400,000 will not be too great for two vessels of the class required for service on the lakes. Your suggestion that several good vessels should be provided for lake service is in perfect accord with the views of this department. I beg to say further, in reply to the closing inquiry of your letter, that at least two additional revenue cutters should be constructed for service on the Pacific coast. The vessels now there are all very old and of obsolete type of construction—some wooden, some iron, all of them too small and too slow and of too small power to properly meet the service required of them. Vessels required for service on the Pacific coast should

Great Britain in commercial supremacy will be the United States. This is inevitable and is but the outcome of those irrevocable laws that govern the progress of commerce. It is commerce that will rule the world for the next hundred years. And in this Europe has no longer the lead.—New York Maritime Register.

New Plant for Unloading Ore at Ashtabula.

During the latter part of last season there was in operation on the ore docks of the P. Y. & A. Ry. at Ashtabula, operated by M. A. Hanna & Co. of Cleveland, a new plant for unloading ore, which is illustrated herewith. Next season this plant will have ten legs and it will be used very largely for rapid work in unloading vessels of the 400-foot class, which will soon predominate in the ore trade. The apparatus was designed and built under patents and rights granted the King Bridge Co. of Cleveland.

Although perhaps the King Bridge Co. is not generally known to be engaged in work of this kind, they have built a number of machines of this character, the first being as far back as 1882. The hoists are built entirely of wrought and cast steel, which has been subjected to thorough in-



EIGHT-LEG KING CONVEYING PLANT AT ASHTABULA HARBOR.

be of size, general dimensions and capacity to enable them to take and keep the sea under all conditions, with a cruising radius of not less than 2,500 miles."

Develop and Strengthen our Merchant Marine.

Any foreign war that this country should engage in would be mainly maritime. Passing events show that the time has gone by when the United States can have no fear of foreign entanglements. Taking these views into consideration, it is evident that everything should be done to develop and strengthen the maritime interests of the country. A first-class navy must be made, but it should not be so top-heavy as to be all military with no commercial part. The merchant navy must be built up, for without it our maritime interests will all be in the hands of foreigners, and our export trade in case of war would be entirely at their mercy. Stripped of all illusions, the real facts in the case show that other nations hate England and are anxious for her overthrow, simply because she has beaten them all at the game of commerce. She is all powerful because of her lead in trade, and they can not beat her until they take her trade away. They may bluster and talk of alliances to keep her within bounds, but all this is talk, and should there be a fight Europe will get nothing from it. The successor of

spection throughout its manufacture. Care has been taken that the structure should be well designed and detailed from an engineering standpoint, which is of the first importance when the very hard usage that is required of it is considered. The hoists shown in illustration are arranged in pairs—that is, two bridges have one support in common at the rear, designated as the rear tower, while there is a separate support or leg at the front for each bridge. All of the towers are supported on wheels placed on substantial tracks, consisting of two rails at the rear and one in front. The moving of the plant from one point to another is done by steam or electric power at the rear, while at the front it is by means of hand gearing. The bridges are hinged to each side of the top of rear tower, and at the top of the front tower they are hung by means of adjustable connections. This mode of attachment allows the bridge or projecting apron, without being strained in the least, to be operated directly from the hatchway of a boat without moving the whole machine.

The principal dimensions of the machine are 180 feet between towers, with 88 feet cantilever and 34 feet apron on the front tower, which can be raised and lowered by power at will, so as not to interfere with the masts of vessels when they are taking position in front of the plant. There is a clear space under the bridges from top of dock of about 30 feet, which

Lake Superior Iron Ore Production for 1895 and the Past Forty Years.

Supplement to THE MARINE REVIEW, Cleveland, Ohio.

January 16th, 1896. Vol. 13, No. 3.

NAME OF MINE.	Prior to 1879	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	TOTALS	NAME OF MINE.	Prior to 1879	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	TOTALS.	
Marquette Range.			797	4,702	8,006	3,618	2,916			1,483	13,099	20,032	21,000	21,604	15,076				112,933	Menominee Range.																				
American (Sterling).																			6,298	Antoine.																27,931				
Ames.																			801,851	Appleton.																2,107				
Barnum (B.).	411,891	24,015	24,522	27,883	41,778	62,762	69,408	47,458	62,975	16,123	10,211	12,836							16,637	Arango.																762,537				
Bay State.	8,583	3,330	2,298	583	1,230	631													847	Armenia.																78,969				
Beattie.																				Beta.																4,211				
Beauford.					5,532	18,976	18,360	17,166	17,354	12,829										Brier Hill.																1,811				
Blue.																				Calumet.																1,811				
Boston.			6,478	14,824	18,245	20,190	2,218													Chapin.			34,556	134,521	247,506	255,830	290,972	157,455	198,871	336,128	290,871	518,990	742,843	488,749	660,052	489,134	235,835	618,589		
Boston (A.).																				Claire.																38,713				
Brustad.	30,157	11,131	13,279	21,146	33,396						10,860	24,686	30,801	50,919	100,464					Columbia (H).																66,964				
Brustad (Wint'p.).	140,828	26,595	45,247	43,639	23,005	50,143	73,144	53,913	58,743	74,067	86,789	155,341	80,359	34,662	41,545	30,445	47,218	41,656		Commonwealth.																35,352				
Cambria.	22,776	6,724	6,958	19,246	64,545	47,508	69,742	50,796	58,784	41,130	57,861	72,780	80,359	34,662	41,545	30,445	47,218	41,656		Cornell.																1,811				
Champion.	624,652	91,027	112,401	145,427	159,009	104,960	210,180	173,915	137,303	146,330	174,680	215,098	223,442	7,301	29,403	19,096				Crystal Falls.																13,037				
Cheshire (Swanzy).	48,543	17,985	13,292	15,011	31,498	13,730	3,557													Curry (G).																416,928				
Chicago.		949	2,415	5,531		117														Cyprus (G.).																28,722				
Cleveland.	1,882,595	131,167	212,748	198,569	206,120	218,219	225,674	218,757	203,664	207,441	184,316	274,048	281,788	310,807	218,105	143,706	221,153			Delphic.																100,681				
Cliffs Shaft (B.).																				Dun.																125,773				
Columbia (Klom'n).	64,212		6,663	11,158	12,066	714														Fairbank.																1,697				
Curry.																				Florence.																				
Detroit.					5,402	12,514	3,806	18,125													Great Western.																			
Dexter.					4,875	16,202	750														Groveland.																			
Dey.																				Half and Half.																				
East Champion.	46,610	4,029	10,217	3,408	4,000	5,039														Hamilton.																				
East New York.																				Hemlock.																				
Edison.																				Hersel.																				
Eric.						2,731	5,405														Hiawatha.																			
Fitch.						1,091														Hollister.																				
Foster (B.).	100,012	4,804	1,122	3,011	11,648	10,029	9,675	9,643													Hope.																			
Gibson.																					Indiana.																			
Goodrich.	14,388	3,992	11,131	10,245	9,938																Iron River.																			
G'd Rapids (Davis).																					Keel Ridge.																			
Hartford.																					Lee Peck (D).																			
Hortense (N.Ch'p'n).																					Lincoln.																			
Humboldt.	436,264	18,204	14,726	26,302	43,463	31,866	23,763	11,766	20,207	19,873	11,656	15,866								Loretto.																				
Iron Cliffs.																					Ludington.																			
Imperial.																					Manganate.																			
Iron Mountain.																					Mansfield.																			
Jackson.	1,852,384	103,219	120,620	118,939	56,830	71,273	83,253	68,857	82,370	109,969	128,891	124,682	92,979	92,567	51,009	32,298	42,186			Metropolitan.																				
Jake Superior.	2,036,189	173,938	204,094	282,222	286,509	294,796	236,040	267,622	302,969	240,225	288,784	318,321	308,831	366,715	329,610	344,758	342,439			Michigan Explo.Co.																				
Lillie.	24,578	22,580	18,347	16,748	27,494	4,614															Millie (Howitt).																			
Lucy (McComber).	164,126	28,962	31,206	28,051	40,406	14,676															Monitor (Lamont).																			
Manganate.																					Nanaimo.																			
Marquette (C.).																					Northwestern.																			
Mesabi's Friend.																					Norway (G).																			
Michigan.	276,239	56,970	52,766	57,272	43,712	42,533	25,935	12,373	48,790	58,726	36,448	56,909	80,777	23,169	1,894	935	1,510	3,214		Paint River.																				
Milwaukee.		941	13,142	31,633	40,891	806	25,991	38,465	46,693	50,490	48,908	52,727	24,763							Penn Iron M'ng Co.																				
National.	4,191	33,310	29,351	24,833	23,366	21,178	13,987														Perkins.																			
Negaunee.																					Perry.																			
" Con Wks.																					Pewabic.																			
New York (York).	808,887	57,528	58,512	50,074	56,806	1,517	1,677														Quinnessee.																			
N. Y. Hematite.	30,681	2,609	2,192		2,105																Selden.																			
North Republic.																					Sheridan.																			
Northwest.																					South Mastodon.																			
Norwood.																					Stephenson.																			
Norpareil (St.Law.).																					Sturgeon River.																			
Pascoe.																					Vulcan (G.).																			
Pendill.	4,000	12,549	3,959	13,586	9,987	318	1,594														Walpole.																			
Phenix (Dalliba).																					Youngstown.																			
Pioneer.																					Total.	82,621	245,672	524,735	727,171	1,136,018	1,047,415	895,634	690,435	880,008	1,198,343	1,191,101	1,796,754	2,282,237	1,824,619	2,261,499	1,466,197	1,137,949	1,923,798	2,130,704
Pitt & L. Angel's.	467,588	25,321	14,928	18,060	14,326	27,22																																		

A—Now Queen Iron Mining Co.

F—Succeeds Buffalo Mining Co.

B—New Iron Cliffs

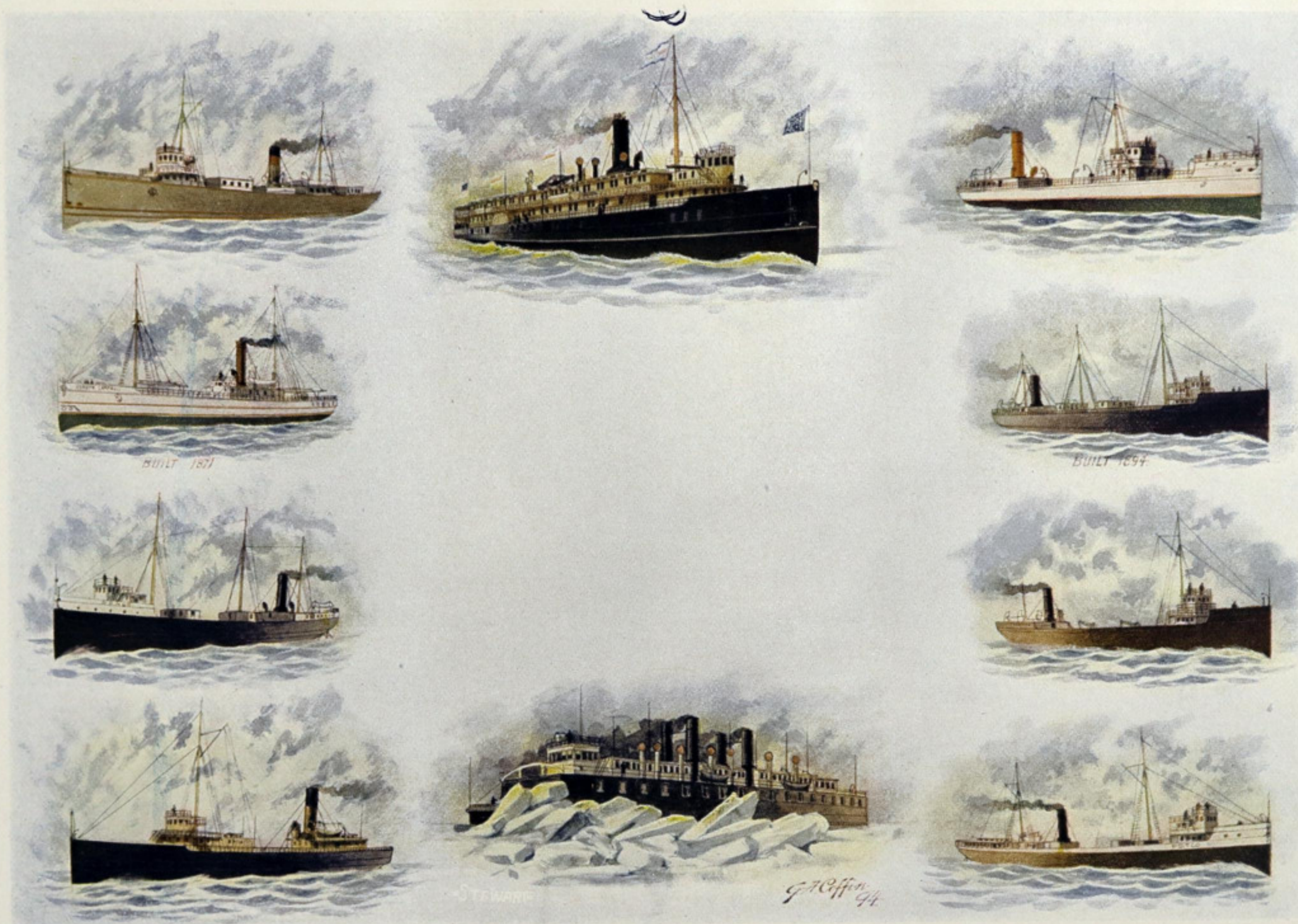
C-1892 and later shipments included in Winthrop

D—Cherry Valley Ore.

E—Includes Tilden up to 1891.

G—1893 and later shipments given under Penn Iron Mining Co.

H—Formerly Shafer, Sheldon and Union.



SUPPLEMENT TO MARINE REVIEW, ILLUSTRATED, CLEVELAND, O.
JAN. 16, 1896, VOL. 13, NO. 3.

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TEN REPRESENTATIVE LAKE STEAMERS.

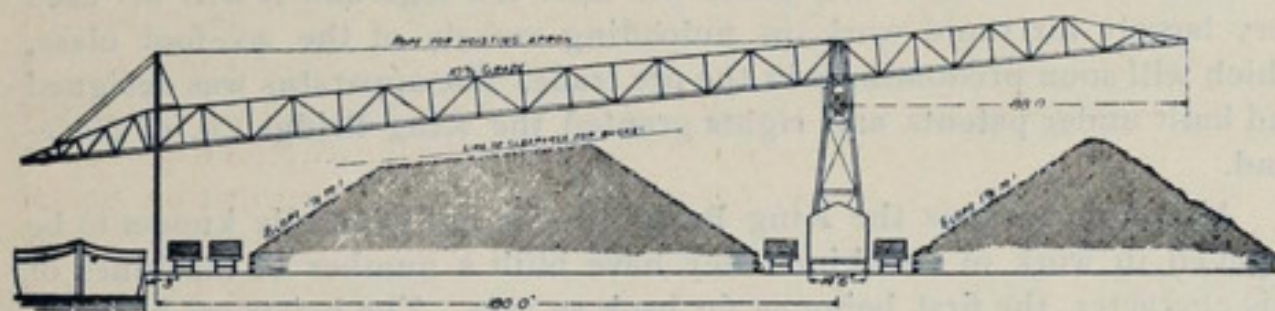
MOHAWK
GORDON CAMPBELL
E. C. POPE
A. McVITTIE

CITY OF ALPENA
SAINTE MARIE

MAHONING
HARVEY H. BROWN
PIONEER
MARYLAND

gives ample room for storage purposes, providing it is not convenient to unload a vessel directly into cars. The bridges are on a grade to increase the storage capacity of the dock. In arranging and placing the operating machinery for a plant of this kind, the primary object in view is to combine the greatest possible efficiency with a simple and durable design, for while the work per day expected of a machine of this kind is considerable, yet at the same time the men who operate it are not apt to be skilled mechanics with an understanding of the proper endurance of a piece of machinery. It becomes, therefore, imperative to the successful operation of the plant that there be few points depending on the judgment of the operator for their being kept in good condition. Keeping this in view, the design has been to confine all machinery to the engine room, where it is under the constant watch of the engineer, and outside the engine room on the bridge are only the sheaves and steel ropes, not so apt to get out of order and require constant attention.

The hoisting engines are of the well known Lidgerwood pattern, with reversible link motion, and these, together with the boilers, etc., are placed in an engine room built in the rear tower, from which two legs on



bridges are operated. The rear tower is also propelled up and down its track on the dock by a gearing machine located in the engine house, from which also power is furnished to raise and lower the apron at the front tower. The bridge is constructed with an upper and lower runway, the upper forming the track for the hoisting and the lower for the conveying carriage, from which are operated wire conveying ropes to which the buckets are attached and can be operated so that the bucket can be hoisted and conveyed at the same time and take the shortest line between two points, and be stopped at any height and place and does not have to be brought directly in contact with the carriage before the conveying takes place. No complicated latch mechanism is required and this is a point of great benefit to the machine in the matter of time of operation and simplicity of construction.

This plant of eight legs has thus far given entire satisfaction. When it had been in operation only a few weeks the parties for whom it was built ordered an additional set of two legs, which is now being constructed and will be ready for operation next spring. Ten legs are now considered no more than enough to handle boats of the latest style, which are in some cases 432 feet in length over all, with 12 hatches and a capacity of 6,680 net tons of ore on 19 feet draft.

Mr. Geo. B. Raser, manager of the P. V. & A. dock at Ashtabula, selecting at random from his reports, advises that on Sept. 26, 1895, the steamer Roman, with 2,500 gross tons of ore, commenced unloading in cars at 6:30 a. m. and finished at 5:30 p. m., and on Sept. 28, 1895, the steamer German, with 2,540 gross tons of ore, commenced unloading in pile at 7 a. m. and finished at 5:30 p. m. An allowance in each case, of course, should be made for a shut-down of one hour at noon, and in neither of these cases was any special effort made to obtain a record or special good showing. They represent the average daily work of the eight legs in the plant, which will, of course, be increased when the others are in operation. It should also be noted that this work was done when the plant was new, and the operators new also. It was found that later in the season, when operators had acquired more experience in handling the machinery, that better time was made. These reports are for average work each day under ordinary circumstances. They do not represent the actual efficiency of the hoists, as the boats were unloaded into cars standing on the two tracks near the water front, and not into pile, and there is, of course, always a loss of time from switching occasioned in pulling out the loaded cars and replacing them with empties, which consumes from 30 to 50 per cent. of the time. This loss of time occurs in a large measure for the reason that the hoists are necessarily very close together, on account of the short space between the hatches of vessels, and therefore the cars have to be placed alternately on the tracks, and one hoist can only have one car to load in at a time; and while this is being taken away and replaced by an empty the hoist must necessarily lie idle. This is under the present arrangement of operating the tracks at the plant under discussion, but it is understood that it is the intention of the managers of the dock to add two more tracks, making the number four in all, in order to be able to place two cars under each hoist at the same time, thus making the work continuous, so that there need be no interruption in hoisting for lack of cars. This will, of course, lose a certain amount of space for storage, but when direct shipment from vessel to cars is the principal requirement in a very busy season, the storage capacity of the dock is a secondary matter, and towards the close of the season can be increased, if necessary, by simply doing away

with the two additional tracks and using the room for the purpose of storage.

This mode of rapid unloading by continuous work only becomes practical when it is possible to stop and start the conveying carriage at any desired point without changing any stops or other parts on the bridge, and it is one of the great advantages claimed for this hoist that it is possible to do this without the operator leaving either of his two levers. The general arrangement of machinery, mode of operation and important details, as well as various safety devices, are all covered by the Rasch and other patents controlled by the King Bridge Co. It is the intention of the King company to operate this branch of their business hereafter more extensively than in the past. They are also engaged at present in perfecting a coal handling device for unloading cars directly into boats.

Miscellaneous Matters.

A contract for the re-construction of the Wisconsin Central ore dock at Ashland has been let to the Butler-Ryan Co. of St. Paul. The cost of the improvement is placed at \$75,000.

Capt. Albert R. Manning's interest in the firm of Brooks, Manning & Co., Cleveland, has been purchased by Henry M. Brooks. The business of the old firm will be carried on by Henry M. Brooks and Harry H. Culp, under the name of Henry M. Brooks & Co.

About 300 engineers are to be engaged on the work of surveys preparatory to expending the \$9,000,000 appropriated a short time ago for New York state canal improvements. It is now thought, that little, if any, of the actual work of improvement on the canals can be done this winter.

S. F. Hodge & Co., Detroit, will build triple expansion engines for the large steel tug which is being built by the Craig Ship Building Co. of Toledo for the Wisconsin & Michigan Railway Co. The tug will be 145 feet over all, 135 feet keel, 30 feet beam and 16 feet 3 inches depth of hold, and the engines will be 18, 30 and 50 inches diameter by 36 inches stroke.

Officers of the Ship Owners' Dry Dock Co., Cleveland, elected a few days ago, are: President, Capt. Thomas Wilson; vice president, Capt. Geo. Stone; secretary, treasurer and general-manager, Geo. L. Quayle; assistant general-manager, Gustav Cold; counsel, H. D. Goulder; directors, Thomas Wilson, Robert Wallace, J. E. Upson, Valentine Fries, George Stone, H. D. Coffinberry, and H. D. Goulder.

Manager David Carter of the Detroit & Cleveland Steam Navigation Co. is quoted as favoring a high bridge at Detroit. This is natural. Senator McMillan, who is the prime mover in the bridge matter, is the largest stockholder of the Detroit & Cleveland Co. There is no way to prevent Mr. Carter taking any position he sees fit regarding the bridge, but he is only one member of the Lake Carriers' Association, and he is only one vessel owner favoring the bridge against hundreds who oppose it.

The Standard Oil Co's tank barges, which were built last winter by the American Steel Barge Co., carry electric lights that are vapor proof, so that there is no danger of an explosion or fire from them even when naphtha is being carried. Two large pumps in the forward part of the boat are used to discharge the cargo, and when these are run at full capacity the cargo of 10,000 barrels can be discharged in six hours. A double bulkhead between the boiler-room and oil tanks is kept full of water all the time as a protection against fire. Two powerful steam pumps also supply a protection from fire.

Six contracts for car dumping machines, to be used for transferring soft coal in car loads to vessels at Lake Erie points, are now held by the Brown Hoisting & Conveying Co. of Cleveland. It is expected that all of the machines will be in operation early next season. Contracts are with the following concerns: Columbus, Hocking Valley & Toledo Railroad Co., at Toledo; Toledo & Ohio Central Railroad Co., at Toledo; Youghiogheny River Coal Co. and James W. Ellsworth & Co., L. S. & M. S. docks at Ashtabula; New York & Cleveland Gas Coal Co. and Ohio & Pennsylvania Coal Co. on the Cleveland & Pittsburgh dock, Cleveland; Huron Dock Co., on docks of the Wheeling & Lake Erie Railroad Co. at Huron. It is expected that each of the machines will have a capacity of 3,000 tons daily.

It is about settled now that the new steel package freight steamer that is being built by the Union Dry Dock Co., Buffalo, will be owned and operated by the Union Steamboat Co. It was thought that the vessel would probably be sold to other parties and this is why the Union Steamboat Co. was not named as owners when the keel was laid some time ago. The new ship is 336 feet over all, 44 feet beam and 27 feet 3 inches moulded depth, of which latter 50 inches will be taken up by water bottom. Cylinders of the triple expansion engines, which will be built by H. G. Trout & Co. of Buffalo, will be 23, 38½ and 64 inches diameter by 42 inches stroke. The boilers will be built by the Lake Erie Boiler Works, also of Buffalo. There will be four of them, each 11½ feet diameter and 13 feet long.

The Treaty Should be Amended.

Lake ship builders have reason to be pleased with the broad spirit shown by ship building interests on the Atlantic coast in regard to the matter of abrogating the treaty with Great Britain which prohibits the construction of vessels of war on the lakes. Not long ago, Mr. Charles Cramp of the big Philadelphia concern wrote to Secretary Carlisle one of the strongest articles that has as yet been presented on this subject, and now the Marine Journal, a representative organ of eastern ship building interests, prints a leading editorial that supports in a very forcible manner the position taken by lake builders. The Journal says:

"It is high time that congress took some action in a matter that every once in a while crops up and by the progress and development of the country becomes more pressing every day. This is the prohibition of building war vessels on the great lakes. Owing to the treaty between Great Britain and this country made after the war of 1812 it is not possible for either nation to build or maintain vessels of war on the lakes upon which the two nations have boundaries. This was an excellent idea when it was devised. It has saved both countries vast expense in the maintenance of armed fleets on the lakes and of a tremendous line of fortifications along the line which divides the United States from Canada. It has been faithfully lived up to by both nations, generation after generation, until the present time, and it is to be hoped that its friendly spirit may continue as long as there are two flags upon the inland waters. In the progress of events, however, circumstances have arisen which make it undesirable that the strict letter of the treaty should be longer maintained. If these circumstances had been foreshadowed when the treaty was made it is very certain that the contingency would have been provided for, but as the development of the ship building industry on the lake front was then wholly unanticipated, it was but natural that the treaty should neglect mention of its possibilities. Now that ship building has developed on the United States side of the lakes to such a tremendous extent that many of the lake yards are entirely capable of competing with seacoast builders, and the St. Lawrence canals already afford facilities of vessel transportation undreamed of when the treaty was framed, there appears every reason why the matter should be looked at in its modern light and concessions agreed upon to permit the building even of warships upon the lake front.

"That such concessions would be equally fair to both countries will readily be seen upon consideration. That the Canadians have not acquired ship building facilities equal to those of their neighbors on the opposite side of the lakes must be solely owing to their inferior enterprise, ability and population; the people of this country have done nothing outside of legitimate competition to prevent them. At the same time it must be borne in mind that they have utilized their limited abilities to advantage, and even now, under the guise of fishery protection cruisers, maintain three steel steamers with ram bows, armed with guns that can throw shells three or four miles, besides having abundant stores of arms and ammunition at their lake front harbors with which to equip merchant steamers and transform them at short notice into powerful cruisers. A modification of the treaty to enable the construction of war vessels on the lake front would be equally to the advantage of the Canadians, and it should, of course, be continuously agreed that no war vessels should be maintained on the lakes. But that it would not avail anything for Great Britain to object to such a concession if the emergency arose requiring the use of lake ship yards for the construction of war vessels is also evident, for we have the facilities for construction whenever we choose to use them.

"All laws by the changes of time become liable to necessity for amendment in order to apply their principles to more modern conditions, and this is the view that must be taken of the old treaty. There is not the slightest desire to be unfriendly with England or Canada, and we imagine that the fairness of the amendment we suggest would be received entirely in the proper spirit by the Britishers if properly represented by our government. It seems altogether probable, indeed, that if the Canadians were in the same disadvantageous condition as this nation now finds itself in regarding the treaty, they would be equally anxious to have such an amendment, and the only reason they have not first moved in the matter is because they have not equally developed the demand. Meantime our lake ship builders are constantly giving evidence of their ability to compete with coast builders in the construction of good, speedy and powerful vessels. They pay taxes equally with coast builders for the development and maintenance of our navy and they should be permitted to equally profit by their advantages in ability to bid for government contracts. That they are prohibited from partaking in this industry was demonstrated by the recent decision of the government throwing out the bid of a Detroit company for the construction of gunboats at their lake front yard. The opportunity for legislation to meet the occasion is now open to congress."

ALL NEW HYDROGRAPHIC CHARTS ARE KEPT IN STOCK BY THE MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND.

Around the Lakes.

Capt. George W. Vickery, who sailed a number of well known crafts in the early days of lake navigation, died at Oswego recently aged 77.

There is some doubt as to whether foreign insurance companies will bid for the grain cargo business out of Duluth. It is said that they took the business at 15 cents last year and lost money. Local companies have bid 30 cents for the business next season.

M. J. Steffens of Chicago is having an \$85,000 steam yacht built by E. W. Heath, Benton Harbor, Mich. She will have a Warrington water tube boiler, will be 85 feet long and 14 feet beam. Her triple engines are expected to drive the yacht fifteen miles an hour.

Nothing definite is known of the Ann Arbor No. 1 losing seven loaded cars in the middle of Lake Michigan recently, but it is said that the whole twenty-four cars were loose and moving back and forth on the track, and that after seven went overboard the balance became wedged. The accident was probably due to carelessness in fastening the cars.

Col. Jared A. Smith, in his annual report, strongly recommends the building of a breakwater at Ashtabula, the cost of which he estimates would be \$465,000. To further the project the city council has appointed a committee consisting of Mayor McKinnon, H. L. Morrison and J. P. Manning to go to Washington and labor with the river and harbor committee for a liberal appropriation. Mayor McKinnon attended the annual meeting of the Lake Carriers' Association, to secure a resolution declaring a breakwater at Ashtabula a necessity, and the Ship Masters' Association, which meets at Washington, Jan. 21, will be asked to do likewise.

Representative Dalzell, of Pittsburg, has introduced a bill in congress furthering the Pittsburg ship canal scheme. It is to incorporate the Lake Erie & Ohio River Canal Co., with Andrew Carnegie, Geo. A. Kelley, and nearly a score of other Pittsburg gentlemen as incorporators. The bill authorizes the construction of a canal from Pittsburg, near the junction of the Allegheny and Monongahela rivers, thence by way of the Ohio, Beaver and Mahoning rivers in Pennsylvania, and the Mahoning in Ohio, to a point at or near Niles, O., and thence northwardly through Ohio to the most accessible harbor on Lake Erie. To succeed with a canal bill and to build a canal will be found two very different matters.

Representative Corliss introduced his bridge bill in congress, Monday. It differs in several important particulars from the one previously offered in the senate by Mr. McMillan. It provides that the bridge shall have three spans. That on the American side shall be not less than 650 feet; that on the Canadian side not less than 450 feet, and the center span not less than 1,100 feet. The purpose of this distribution is to bring the central span directly over the main channel of the river. The bill states that there shall not be more than two piers in the river. The secretary of war is to appoint a commission of three disinterested engineers to establish the location of the approach within these limits, to make rules for the equitable use of the bridge by the different railroads and to locate the piers.

Stocks of Grain at Lake Ports.

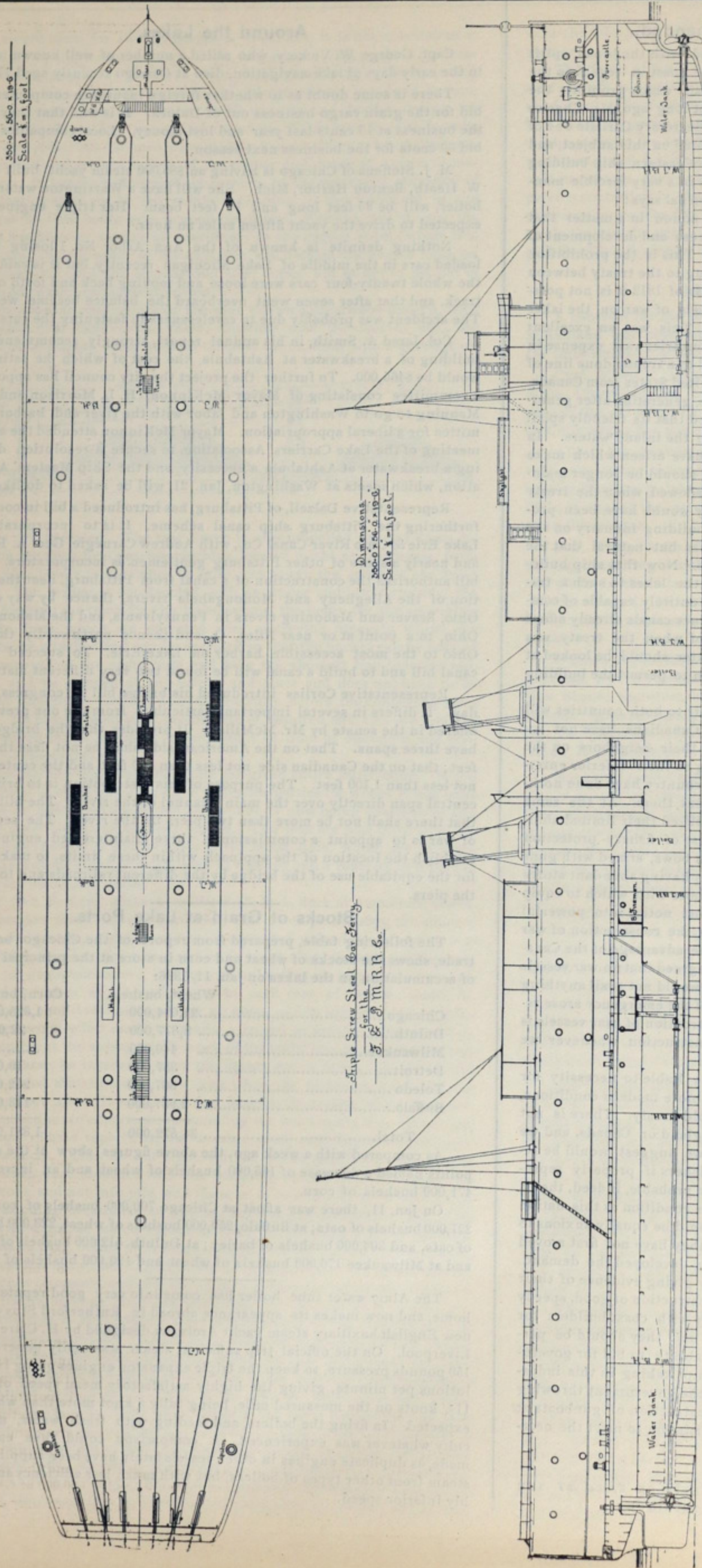
The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on Jan. 11, 1896:

	Wheat, bushels.	Corn, bushels.
Chicago.....	21,094,000	1,525,000
Duluth.....	8,877,000	22,000
Milwaukee.....	440,000
Detroit.....	357,000	19,000
Toledo.....	867,000	202,000
Buffalo.....	2,937,000	113,000
Total.....	34,572,000	1,881,000

As compared with a week ago, the above figures show at the several points named a decrease of 165,000 bushels of wheat and an increase of 471,000 bushels of corn.

On Jan. 11, there was afloat at Chicago 700,000 bushels of corn and 227,000 bushels of oats; at Buffalo, 259,000 bushels of wheat, 223,000 bushels of oats, and 304,000 bushels of barley; at Duluth, 512,000 bushels of wheat; and at Milwaukee 176,000 bushels of wheat and 120,000 bushels of oats.

The Almy water tube boiler has come into very good reputation at home, and now makes its appearance abroad in Rutherford Stuyvesant's new English auxiliary steam yacht Arcturus designed by H. Clare Byrne, Liverpool. On the official trip sufficient steam was easily generated, at 150 pounds pressure, to keep the triple expansion engines going 140 revolutions per minute, giving the highly satisfactory mean speed of nearly 11½ knots on the measured mile, being fully a knot more than what was expected. In firing the boilers, and feeding with fresh water, no difficulty whatever was experienced. A comparison could thus easily be made, as duplicate engines in other vessels lately have been supplied with steam from other types of boilers, but with much less efficiency and notably inferior speed.



Flint & Pere Marquette Car Ferry.

The car ferry to be built by F. W. Wheeler & Co. of West Bay City for the Flint & Pere Marquette Railway Co., will be one of the strongest and most costly vessels of her kind ever constructed in this country and the REVIEW is pleased therefore to present the accompanying engravings, which are from working drawings and which give a general idea of plans upon which the vessel will be constructed. This vessel will run exclusively on Lake Michigan between Manitowoc and Ludington and will be in every way fitted for winter as well as summer service.

The length of this car ferry between perpendiculars will be 331 feet, her over all length 350 feet, beam 56 feet, depth below main deck 19½ feet, depth from upper deck to floor 37 feet. The steel frames and plating will extend from bilge to upper deck, and the main and upper decks also are to be of steel. In preparing the plans for the craft particular attention was devoted to the matter of strength. This is evidenced by the fact that 2,700 tons of steel will be used in her construction. The bow of the new steamer is to be double-plated with ¾-inch plates for a distance of 30 feet abaft

the stem, and this double plating will extend 3 feet above the load line. To resist the great pressure of ice shoves, channel beams thoroughly secured both vertically and horizontally will span the hull at close intervals about midway between the floor and the main deck. The hull will have six watertight compartments but no water-bottom. A shield of forged steel will afford protection for the rudder, and the shafting of the two after wheels will be housed in as on the Northern line steamers North Land and North West.

The steamer will have three fore-and-aft compound engines of equal power each, with 24 and 48-inch cylinders and 36-inch stroke. One of these engines will work the bow wheel, the other two the stern wheels. Steam is to be furnished by four boilers, each 13½ feet in diameter and 12 feet long. The wheels are to be of steel, the two aft of 11 feet and the forward one 9½ feet diameter. The upper works will be of wood. They embrace a cabin with accommodations for twenty-five passengers in connection with the pilot house, texas, etc., and a house abaft the smoke-stacks to provide quarters for the crew. The steamer will carry thirty loaded cars and 200 tons of coal on a draught not to exceed 13 feet. She is to be completed in October next.

New Officers Among the Engineers.

M. E. B. A., No. 72, Oswego, N. Y.: President, Andrew Griffin; vice-president, Leon Jewett; recording secretary, James Donovan; financial secretary, Robert Cronley; conductor, S. T. Axtell; treasurer, Thomas Navagh, No. 40 Lake street; corresponding secretary, Thomas Navagh, No. 40 Lake street; door-keeper, P. T. Perkins.

M. E. B. A., No. 43, Port Huron, Mich.: Past president, George E. Miller; president, W. P. Boynton; first vice-president, Walter Thorn; second vice-president, Anthony Rein; recording secretary, James Southgate; corresponding secretary, George H. Bowen; financial secretary, Irvin Buzzard; treasurer, Arthur Armson; conductor, L. C. Purdy; chaplain, Hiram Smith; door-keeper, Henry Roundeau; trustees, Arthur Arnson, George H. Bowen and Irvin Buzzard; delegate to national convention, George Miller.

Consolidated association No. 33, M. E. B. A. of New York, the banner organization of the country, now numbers among its members about all the chief engineers of the different American steamship lines running out of New York. It is the largest organization of the country, numbering nearly 800 members. The secretary of this association, Mr. W. J. Du Bois of Tompkinsville, L. I., writes the REVIEW that they have a splendid building, one floor of which is taken up by an assembly room, another by a library and office and a third is arranged for the exhibition of machinery and various devices in which engineers are interested. Mr. Du Bois says that before another year is over it is probable that the New York association will about double its membership.

M. E. B. A., No. 1, Buffalo, N. Y.: President, Frank Miller; vice-president, Theo. M. Yers; recording secretary, Duncan N. McVicar; corresponding secretary, Albert Scott; financial secretary and treasurer, Peter Burns; chaplain, Fred. Hale; conductor, James Wickstead; trustee, James Brooks; delegate to national convention, Frank Miller.

M. E. B. A. No. 92, Saginaw, E. S., Mich.: Past president, Jacob Oscar; president, Charles Morgan; vice-president, Joseph D. Budd; treasurer, John Henry; financial secretary, Walter Henry; corresponding secretary, Harry E. McSothorn, 17 McCormick Building; recording secretary, Frank Nold; conductor, Joseph R. Hale; door-keeper, Fred. Pfleuger; representative to the national convention, John Henry.

Ship Master's Association—New Officers.

Lodge No. 8, Marine City, Mich.: President, J. S. Ward; first vice-president, J. Jenkins; second vice-president, P. Rice; treasurer, R. A. Cottrell; financial secretary, W. H. Scott; recording secretary, G. A. Shaw; chaplain, T. E. Welker; marshall, William Hagan; warden, William Rattery; sentinel, A. Yax.

Engineer-in-Chief Melville.

We congratulate the service at large and particularly the corps of engineers upon the decision of Secretary Herbert to nominate George W. Melville for a third term as engineer-in-chief of the navy. We also congratulate Engineer-in-Chief Melville upon the honor which has been conferred upon him and predict for him in his coming term greater success, if possible, than has characterized the two he has passed through. His nomination will be sent to the senate. There has never been any doubt that Engineer-in-Chief Melville would be re-nominated. His work during the past eight years has been of such a character as to compel his reappointment. Last winter, when the matter was brought to the attention of the president, he declared his intention of continuing in office the present engineer-in-chief. He has been one of the leaders in placing the new navy upon its present sound basis. His word is weighty in the deliberations of the board on construction, which passes upon important questions relating to ship construction, and his advice is always relied upon by the authorities. In talking with the Journal representative some months ago Secretary Herbert expressed the greatest confidence in his engineer-in-chief. To him is due the triple-screw flyers, and the credit for other important innovations has justly been given to him. His record every one knows. It is clean and straightforward and is brightened by the many acts of daring which its possessor has performed, particularly in connection with the Jeannette expedition.—Army and Navy Journal.

In a lecture delivered recently on the use of aluminum in vessel construction, Mr. Yarrow, the noted English ship builder, who has given the subject a considerable amount of attention, declared that the metal absorbs a comparatively low degree of temperature, thus, of course, loses some of its strength, while alkalis act very rapidly upon it. In view of these facts, Mr. Yarrow is of the opinion that any part liable to be subject to a considerable rise of temperature should not be made of aluminum, nor should it be employed for a condenser where soda may be required for cleaning purposes. At high temperatures aluminum is found to oxidize with exceptional rapidity; at low temperatures, it does not oxidize with such rapidity, and the film of oxide on the surface protects it from further action.

Trade Notes.

The Roberts Safety Water Tube Boiler Co., has issued a calendar with a mythological subject for illustration. Engineers may obtain a copy on application.

A very striking calendar in red, yellow and green comes from the Penberthy press. The different specialties of the company are illustrated on a tinted back ground, and a copy will be sent to engineers on application to the Penberthy Injector Co., Detroit, Mich.

The Berlin Iron Bridge Co. of East Berlin, Conn., have just completed for the town of Houlton, Me., a new iron bridge 300 feet long and 18 feet wide, with a sidewalk 5 feet wide. The bridge company furnished the entire bridge, sub-structure and superstructure complete.

The Ocean Publishing Co., 29 Broadway, New York, has issued another of their finely illustrated booklets for the French line. All their work is handsomely illustrated, but each succeeding issue is more handsome than the last. Parties interested in artistic marine publications may secure a copy by sending 25 cents to the publishers.

The Wellman duplex roller hoisting for blocks and other bearings is certainly worth inspection. From tests made by the navy department nearly 20 per cent. less power was required for lifting with this bushing than with other bushings. It will wear nearly three times as long. Mr. J. H. Sherman, who represents the manufacturers, is making a visit to lake ship yards to introduce the device.

Holding Power of the Dunn Stockless Anchor.

The American Steel Castings Co., Thurlow, Pa., have made several improvements in their anchors for lake service, and shipbuilders desiring any modifications for special service will do well to write them. English stockless anchors depend largely on the pin holding, and no provision is made for its breaking as is the case with the Dunn anchor. However, the proof of the pudding is in the eating, and the following letter from Captain R. J. Lyons, of the Zenith City, is valuable testimony:

LORAIN, January 8, 1896.

Editor MARINE REVIEW, Cleveland, Ohio: Dear Sir:—Replying to your letter of the 6th inst., would say that we made use of our anchors on Zenith City on two occasions during a heavy breeze and they seemed to hold as well as the old style of anchor. As to whether they (the Dunn), are as good or better than other makes of stockless anchors, I am unable to say as I have never had any experience with any other make.

Yours truly, R. J. LYONS.

This is a very conservative recommendation, but the more valuable on that account. The following letter gives an experience with the Dunn anchor in the navy, where the requirements are very severe:

U. S. NAVY YARD, WASHINGTON, D. C., Nov., 4, 1894.

It gives me great pleasure to be able to give you an excellent opinion of your anchor. After two years' experience on board the U. S. S. Philadelphia I consider it a safe and efficient anchor. We never dragged after the anchor once took hold, and I only remember one occasion when it came up foul. I remember an occasion when anchored off Staten Island in company with U. S. S. Enterprise during a heavy northwest gale, the latter ship dragged with two of the ordinary anchors down, while the Philadelphia, with much more surface exposed to the wind, held with one anchor and seventy-five feet of chain. I would like to be shipmates with your anchors again.

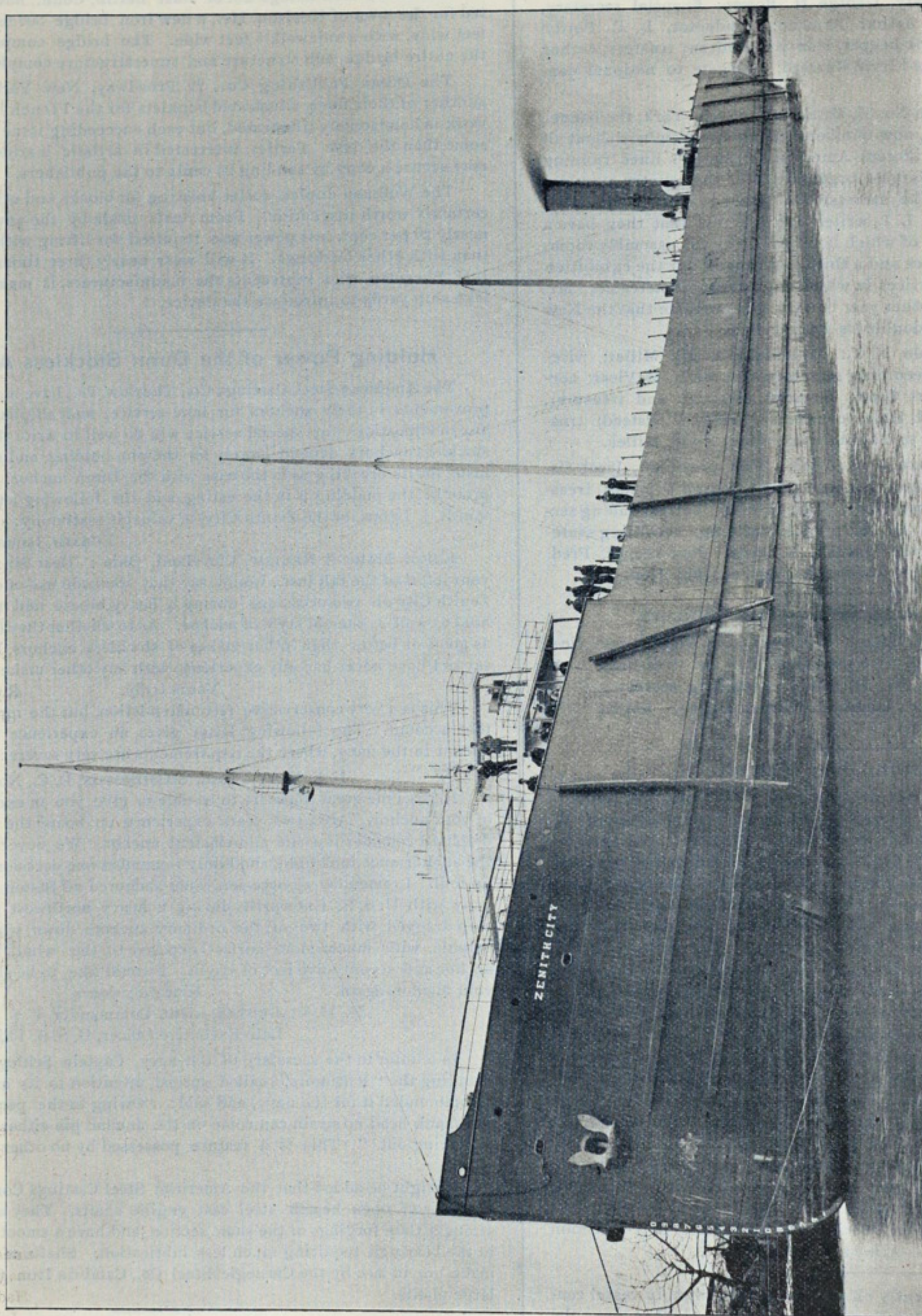
Sincerely yours,

E. H. C. LEUTZE, Lieut. Commander, U. S. Navy,
Late Executive Officer, U. S. S. Philadelphia.

In a letter to the secretary of the navy, Captain Schley, U. S. N., commanding the "Baltimore," called special attention to its excellence, and recommended it for the navy, and said: "Owing to the peculiar shape of the shank head no strain can come on the anchor pin either in holding or 'breaking out.'" This is a feature possessed by no other anchor in the world.

It might be added that the American Steel Castings Company make a specialty of open hearth steel cast engine shafts. They are said to be stronger than forgings of the same section, and have a smooth hard surface in the bearings, requiring much less lubrication. Shafts of the American make are in use by the Carnegie Steel Co., Cambria Iron Co., and other large plants.

Some idea of the magnitude of operations of the Peninsular & Oriental Steamship Co., running between Great Britain and India, China, Japan and Australia, may be gained from the fact that the company expended nearly \$20,000,000 in making additions to and maintaining its fleet and still paid a dividend of 10 per cent. at the annual meeting held recently. The company now owns a fleet of between sixty and seventy vessels, several of which are among the largest afloat. During the past year five ships were built at a cost of about \$3,000,000 and the company has now two vessels building at a cost of more than \$2,500,000 at Greenock and Belfast.



STEEL FREIGHT STEAMER ZENITH CITY—LARGEST ON THE LAKES.

FITTED WITH DUNN PATENT STOCKLESS STEEL ANCHORS.
FOR PARTICULARS ADDRESS,
AMERICAN STEEL CASTINGS CO., THURLOW, PA.

HULL—Length over all,	400 feet.
" " of keel,	380 "
Beam, moulded,	48 "
Depth,	28 "

See page 9.

BIG GATHERING OF VESSEL OWNERS.

LARGEST MEETING EVER HELD BY THE LAKE CARRIERS' ASSOCIATION—DRY DOCK MANAGERS, STEEL SHIP BUILDERS AND UNDERWRITERS ALSO IN ANNUAL SESSION—PROCEEDINGS IN DETAIL.

Specially Reported for the MARINE REVIEW.

DETROIT, MICH., Jan. 16.—Although none of the various subjects discussed by the members of the Lake Carriers' Association at the annual meeting, which closed here today, were of special importance, as compared with big questions that demanded attention a year ago, the meeting was the largest ever held by the organization. Increased attendance at these meetings is the best evidence of the growth and strength of the organization. President Livingstone made a short address in calling the meeting to order Wednesday morning at the Whitney Music Hall, Woodward avenue. He referred to the past year as the most prosperous in the history of the organization, which had expended about \$20,000 in conducting its business affairs, and still found the treasury practically on an even footing. Probably not more than fifteen or twenty vessels, he said, of the kind that might share in the advantages of the association, are still out of the ranks. The indefatigable manner in which the executive committee and other officers had worked during the year he regarded as worthy of special note. He referred to the Detroit river

bridge question as the most important matter to come before the association. Mr. Livingstone has taken part in the opposition to a bridge at Detroit for probably thirty years past, but in addressing the association on the subject he advised great care and a reasonable regard for the railway interests. He paid a very touching tribute to the memory of the late Gen. Poe. "All of you know full well" he said "the great loss sustained in the death of this officer. You know of his long years of labor and untiring devotion to lake and shipping interests. It is due to him to say that never has there been a single time when a question of lake shipping came up that he was not found an unswerving devoted friend. In view of his long service we must take action towards erecting a memento of some kind in his honor. The question of duty to him always stood up like a great granite column, and he never deviated a hair's breadth from that duty to the government and to the lake interests."

After extending thanks to the officers and members of the association for their hearty and constant co-operation in managing the affairs of the association, Mr. Livingstone recognized Harvey D. Goulder of Cleveland who proposed that a special order of business for Thursday at 10 a. m. should be the matter of a memorial in honor of Gen. Poe and that Gen. R. A. Alger should be invited to address the association. Mr. Goulder's motion was readily adopted.

Then followed the reading by Mr. Keep of the annual report of the board of managers, which discusses affairs of the association during the past year, and which deals also with recommendations upon matters taken up at the present meeting. Members of the association were all furnished with printed copies of the report. This report of the board of managers of the Lake Carriers' Association will be found in full on pages that follow. The treasurer's report shows receipts amounting to \$19,499.84. Expenditures and unpaid liabilities foot up \$20,624.60, but there are dues unpaid amounting to \$462.99. The debts of the association therefor amount to \$661.77, a small item which will be made up from receipts of the coming year. Among those in attendance at the meeting were the following:

LIST OF VESSEL OWNERS AND OTHERS IN ATTENDANCE.

Cleveland, O.—C. F. Palmer, Capt. C. L. Hutchinson, Philip J. Minch, John F. Wedow, C. R. Jones, Martin Mullen, N. J. Boylan, Capt. John Mitchell, Capt. Alfred Mitchell, Capt. Geo. P. McKay, Capt. Thos. Wilson, F. W. Jackson, J. C. Gilchrist, Henry A. Hawgood, E. M. Richardson, Geo. S. Minch, Harvey D. Goulder, B. L. Pennington, W. L. Sherwood, James Corrigan, John Corrigan, Capt. Wm. S. Mack, Capt. C. E. Benham, W. A. Hawgood, M. A. Bradley, Capt. W. C. Richardson, Charles Gilchrist, David Barnheisel, Mark Hanlon, J. A. Donaldson, Capt. George McLeod, Capt. W. W. Brawn, Capt. M. H. Murch, R. K. Pelton, Geo. Quayle, James Wallace, John Bartow.

Chicago, Ill.—Capt. J. S. Dunham, J. H. Channon, D. T. Helm, Geo. J. Harris, W. J. Rardon, Capt. James A. Calbick, H. W. Cook, G. C. Blair, Capt. J. G. Keith, Capt. F. D. Herriman, Capt. W. H. Rounds, J. S. Gadsden, Geo. L. McCurdy, C. A. McDonald, John Prindiville, Thomas Prindiville, Joseph Austrian, C. W. Elphicke, A. L. Fitch, Capt. J. Roberts, H. P. Finney, E. J. Henry, Miles Barry, Capt. Cyrus Sinclair, Tom Dean, Dean Steam Pump Works, Indianapolis, Ind., Wm. L. Brown, C. W. Elphicke, J. J. Rardon, J. G. Keith, W. I. Babcock, Amasa Fitch, Thomas E. Miller.

Detroit, Mich.—Capt. Sidney Scott, Capt. James Millen, A. A. Parker, M. W. Humphrey, Capt. C. H. Westcott, J. W. Westcott, Charles Whitaker, Capt. Wm. Forbes, T. Hurley, W. A. Livingstone, Wm. Livingstone, Jr., W. C. McCall, Albert Stewart, Mark Hopkins, Waldo Avery, L. C. Waldo, N. S. Whipple, David Whitney, Herman Ralph, E. M. Peck, N. E. Candler, C. B. Calder, Frank E. Fisher.

Buffalo, N. Y.—Capt. J. J. H. Brown, John Rice, C. H. Keep, P. P. Muller, Capt. J. H. Killaran, J. A. Boland, Ed. Smith, H. J. Mills, Capt. J. W. Hall, J. S. Smith, weighmaster, W. J. Sandrock, Henry Sill, Edward Gaskin.

Bay City, Mich.—F. W. Wheeler, Capt. James Davidson, James E. Davidson, B. Boutell, C. A. Eddy, Capt. Geo. Ryan, Thomas Cranage, Wm. Cranage, C. H. Weeks, Fred Boutell, John Dunnigan, Thomas Madden.

Port Huron, Mich.—Alvin Neal, Henry McMorran, Colin McLaughlin, D. E. Lynn, W. E. Rice, Theodore Wright, John McCarthy, Thos. Currie.

Toledo, O.—G. G. Hadley, W. S. Brainard, J. T. Nagle, W. S. Brainard, John Craig, T. J. Southard, G. G. Hadley, Jr.

Milwaukee, Wis.—David Vance, J. C. Ricketson, Henry Leisk, Wm. McGregor, F. C. Starke, F. H. Starke.

St. Clair, Mich.—Simon Langell, Richard O'Connor, J. R. Whiting, Charles Barshlan, W. E. Recor.

Duluth, Minn.—A. B. Wolvin, H. B. Earhart, G. H. Tomlinson, W. S. Braun, W. H. Singer.

Alpena, Mich.—F. W. Gilchrist, D. McRea, H. L. Churchill.

Amherstburg, Ont.—Capt. Andrew Hackett, Henry Duff.

Mt. Clemens, Mich.—Wm. Dulac, Wm. Flumer.

Sarnia, Ont.—Wm. Haskins, John Nesbit.

Ashland, Wis.—Capt. Alex Sinclair.

Ogdensburg, N. Y.—Frank Owen.

Marine City, Mich.—W. Parker.

Algonac, Mich.—Abram Smith.

Saginaw, Mich.—John Edgar.

Romeo, Mich.—P. L. Millen.

Erie, Pa.—James McBrier.

Following the reading of reports, the chair appointed a committee, consisting of Harvey D. Goulder, Capt. Thomas Wilson, Thomas Cranage, J. S. Dunham, G. G. Hadley, Ed. Smith and J. C. Ricketson, to present names of members of the board of managers and the several standing committees. This committee reported the following changes in the board of managers: W. C. Rinearson, vice John Gordon, Buffalo; W. A. Livingstone, vice Harry Hodge, Detroit; D. T. Helm, vice J. L. Higgin, Chicago. New members of the board are C. F. Palmer of Cleveland, J. W. Westcott of Detroit, H. C. French of Buffalo and G. A. Tomlinson of Duluth. Mr. French was also made a member of the legislative committee. The list of vice presidents contains several new names. The full list of officers follows:

OFFICERS FOR 1896.

President—J. J. H. Brown, Buffalo.

Vice-Presidents—Harvey H. Brown of Cleveland, James W. Millen of Detroit, William P. Henry of Buffalo, J. G. Keith of Chicago, G. A. Tomlinson of Duluth, C. A. Eddy of Bay City, George G. Hadley of Toledo, James McBrier of Erie, Conrad Starke of Milwaukee, F. J. Firth of Philadelphia and Frank Owen of Ogdensburg.

Secretary—C. H. Keep, Buffalo.

Treasurer—George P. McKay, Cleveland.

Counsel—Harvey D. Goulder, Cleveland.

Board of Managers—S. D. Caldwell, Peter P. Miller, E. T. Evans, James Ash, W. Bullard, J. J. H. Brown, W. C. Rinearson, John Rice, M. M. Drake, W. P. Henry, Edward Smith, H. C. French and James McKenzie of Buffalo; Thomas Wilson, M. A. Bradley, James Corrigan, H. M. Hanna, Geo. P. McKay, H. G. Dalton, Harvey H. Brown, John W. Moore, B. L. Pennington,



Ex-President Livingstone's Old Fight—The Bridge Question.



Secretary Keep reads his Annual Report.

John Corrigan, W. J. White, Henry A. Hawgood, W. C. Richardson, J. C. Gilchrist, W. D. Rees, John Mitchell, R. R. Rhodes, Caleb E. Gowen, Wm. S. Mack, C. E. Benham, C. F. Palmer and Philip G. Minch of Cleveland; James W. Millen, William Livingstone, Jr., David Carter, E. M. Peck, D. C. Whitney, W. A. Livingstone, A. A. Parker and J. W. Westcott of Detroit; D. T. Helm, Jesse Spaulding, J. S. Dunham, John Keith, Joseph Austrian, W. R. Owen, C. W. Elphicke, Wiley M. Eagan, J. J. Rardon and James A. Calbick of Chicago; George G. Hadley, W. S. Brainard, and L. S. Sullivan of Toledo; James Davidson, Charles A. Eddy, O. W. Blodgett, F. W. Wheeler, B. Boutell, Thomas Cranage and J. W. McGraw of Bay City; Alex. McDougall, F. N. LaSalle, G. A. Tomlinson and A. B. Wolvin of Duluth; David Vance, R. P. Fitzgerald, J. C. Ricketson and Conrad Starke of Milwaukee; F. W. Gilchrist of Alpena; Alvin Neal of Port Huron; C. T. Morley of Marine City; R. E. Schuck of Sandusky; Frank J. Firth of Philadelphia; Frank Owen of Ogdensburg.

Executive and finance committee—H. M. Hanna, H. H. Brown, James Corrigan, H. A. Hawgood, Thomas Wilson, M. A. Bradley, J. C. Gilchrist, Cleveland, E. M. Peck, D. C. Whitney, Detroit; W. P. Henry, J. J. H. Brown, Buffalo; David Vance, R. P. Fitzgerald, Milwaukee; John G. Keith, J. S. Dunham, Chicago.

Committee on aids to navigation—W. C. Richardson, W. S. Mack, George P. McKay, H. G. Dalton, B. L. Pennington, Thomas Wilson, John W. Moore, Cleveland; David C. Carter, Detroit; W. M. Egan, Chicago; Frank Owen, Ogdensburg; A. W. Colton, Toledo; James Davidson, Bay City; Alvin Neal, Port Huron; M. M. Drake, Washington Bullard, Buffalo.

Committee on legislation—S. D. Caldwell, James Ash, E. T. Evans, P. P. Miller, Henry C. French, Washington Bullard, Edward Smith, Buffalo; H. M. Hanna, James Corrigan, Cleveland; William Livingstone, Jr., James Millen, Detroit; Jesse Spaulding, Chicago; C. A. Eddy, Bay City; Alex. McDougall, Duluth; F. J. Firth, Philadelphia.

ELECTION OF PRESIDENT.

Without a speech or comment of any kind John Corrigan of Cleveland nominated J. J. H. Brown of Buffalo for the presidency. The sentiment in



Pres. Brown takes the chair

favor of Mr. Brown soon showed itself, however, and without the presentation of any other names, several members indulged in praise for Mr. Brown's telling work in behalf of the association. A clause in the annual report showed that the money saving to vessel owners during the season of 1895 in reduced prices of fuel at Buffalo was over \$50,000, while more than \$60,000 was saved through the grain-shoveling contract made with James Kennedy. These were reforms brought about largely by Mr. Brown's close attention to the committee work that was assigned to him, and they were referred to by Messrs. Pennington, Davidson and others who endorsed his nomination. He was elected unanimously, and upon being conducted to the chair he made a short speech acknowledging the assistance he had received from Capt. James Millen and others who were associated with him in committee work.

Mr. Goulder, counsel of the association, who will be called upon to undertake most of the labor of presenting arguments against any kind of a Detroit Detroit river bridge measure that will be objectionable to the vessel interests, was desirous of being fortified with statistics that will contrast the shipping passing Detroit with that of the Michigan Central Railway, and in fact all railways of the country. He introduced a resolution making the bridge matter a special order for Thursday at 11 a. m., and in this connection secured the appointment of a committee to prepare for the association data along the line suggested. This committee is composed of C. H. Keep, secretary of the association; Homer J. Carr, Lake Marine News Association, Chicago; John M. Mulrooney, MARINE REVIEW, Cleveland; George V. Callahan, Plain Dealer, Cleveland; W. A. Livingstone, Detroit; J. W. Perkins, the Journal, Detroit.



Mr. Goulder pays the newspaper men a compliment.

WORK GENERALLY ENTRUSTED TO COMMITTEES.

Upon the opening of the afternoon session on Wednesday the matter of dues for the coming season was readily disposed of. Mr. B. L. Pennington of Cleveland moved to fix the dues at the old figure, 3 cents.



James Davidson wants to know all that's going on.

Capt. James Davidson moved an amendment, fixing the charge at 2 cents per gross registered ton, but Messrs. James Corrigan and Wm. Livingstone supported Mr. Pennington's view of the matter and the rate of 3 cents a ton was adopted. Then followed the appointment of a large number of committees to look after routine matters. Capt. Wm. Mack of Cleveland had been discussing with Capt. Davis of the revenue marine service the question of having the treasury or war department make rules for vessels navigating the St. Mary's river. He brought up this question, and a committee, of which he is chairman, was appointed to talk over the matter with Capt. Davis and report later. Underwriters were invited to meet with this committee. Other members are Capt. Thos. Wilson, Capt. Geo. P. McKay, W. P. Henry, Capt. James Davidson, Capt. James Millen and Capt. J. H. Calbick.

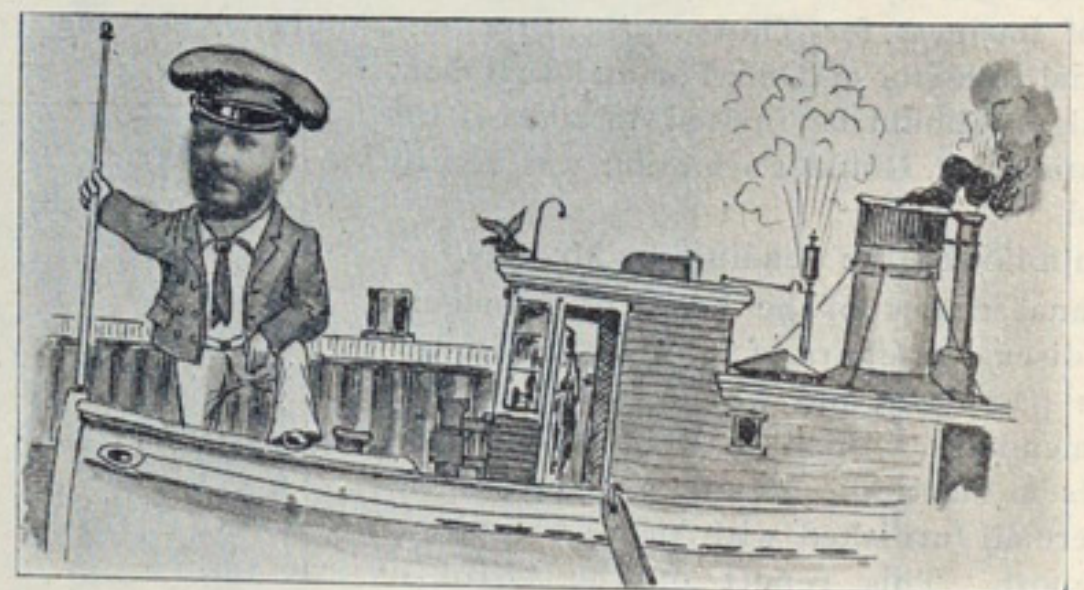
Methods of overcoming abuses in the matter of fueling steam vessels both at Buffalo and Ohio ports, was next in order.

Fuel dealers at Ohio ports, who were all at the meeting, had little to say, but the Buffalo shippers of hard coal, who were practically shut out of the the fueling trade through the agreement adopted a year ago, were anxious to be heard. Messrs. Noble and Grimmell, representing Buffalo firms, were accorded the privilege of the floor. Mr. Grimmell, who represented a cargo shipping concern, claimed that they were practically boycotted through the compact entered into at the last meeting of the vessel owners. It was agreed, however, by several vessel owners, who spoke on the subject later on, that the hard coal shippers showed little mercy towards the vessel owners previous to 1895, and the sentiment was in favor of continuing the agreement not to buy fuel from shippers of hard coal. The fueling question in general was referred, finally to a committee consisting of Capt. James Millen, James Corrigan, John Rice, G. G. Hadley, David Vance, B. L. Pennington, Thomas Wilson, M. A. Bradley and Wm. S. Mack.



John Rice objects to big committees.

Mr. Pennington of Cleveland then introduced a resolution, which was unanimously adopted, providing for the renewal of the contract with James Kennedy of Buffalo to continue, during 1896, the business of grain shoveling at Buffalo. Mr. H. A. Hawgood of Cleveland thought that some attention should also be given to grain shortages at Buffalo, and he introduced a



J. S. Dunham sails into Detroit.

resolution calling for the appointment of a committee to look into that feature of the grain carrying business. The meeting was addressed by J. S. Smith, board-of-trade weighmaster at Buffalo on this question, and the following committee appointed in accordance with Mr. Hawgood's motion: J. C. Gilchrist, Cleveland; James Davidson, West Bay City; Thomas Wilson, Cleveland; J. S. Dunham, Chicago; C. A. Eddy, Bay City.

Petitions were presented to the meeting from Buffalo and Ashtabula favoring extensive breakwater improvements at those points. Discussion

regarding these petitions was forced two or three times during Wednesday afternoon and Thursday morning, and a committee, consisting of M. A. Bradley, David Vance and Alvin Neal, was first appointed to consider them but it was evident that the association was not now disposed, any more than it had been in the past, to consider local matters. Those who had the petitions in charge were finally contented to have them signed by the vessel owners, the association refusing to consider them as an organization.

Mr. Austrian, of the Lake Michigan and Lake Superior Transportation Co., has been specially interested in the construction of a light and fog signal on North Manitou island, Lake Michigan, an appropriation for which has been secured, but erection of the structure is delayed on account of delay in obtaining title to the land. It may be necessary to secure passage of an additional act of congress in order to have this light constructed early next season, and the president and secretary were instructed to devote their best efforts with that end in view.

Mr. Goulder, who was asked for advice regarding the best method of overcoming the abuses attending the operation of the present libel law at Buffalo, said that the matter could be settled without resource to legislation of any kind. A sailor having a very small claim against a vessel, or differing with the captain on even a single dollar of wages, may now libel a vessel at Buffalo, and on account of the United States court being located at Utica, the mileage charges are certain to make the costs in every case at least \$36. Very often a vessel master will agree to an unjust settlement on a small claim rather than encounter delay. Mr. Goulder says that several of the district judges assure him that they will adopt a fair rule of practice doing away with the unjust costs, if the matter is fully presented to them, and it was accordingly agreed that the counsel and secretary should take up this question with the United States district judges and adjust it if possible.

Capt. Geo. P. McKay directed attention to the disadvantages encountered with light-keepers in the Detroit river below Detroit, especially in the spring and fall, on account of delay in communicating with the naval officer in charge of the lights of the tenth district, who is located at Buffalo. He suggested that the boundary line of the tenth district should be changed so that it would not take in any part of the Detroit river. Such a change would place all Detroit river lights in charge of the inspector at Detroit. The president and secretary were instructed by resolution to communicate with the light-house board with a view to having this change made. The secretary was also directed on motion of Capt. Wm. Mack to endeavor to secure an appropriation for dredging out a part or all of the shoal that has been constantly making out into the St. Clair river abreast of Black river. Mr. B. L. Pennington secured the passage of a vote of thanks for the Ship Masters' Association, for its services in Washington a year ago, and also for the assistance which members of the captains' association promise the Lake Carriers during the annual meeting which is about to open in Washington.

SENATOR BRICE'S DAM PROBLEM.

It was thought that Senator Brice's course in urging legislation upon the subject of regulating lake levels by means of dams at various points of discharge would occasion spirited discussion at this meeting. The vessel owners seemed to be all of the opinion, however, that the Ohio senator is moving carefully in the matter, and is simply trying to secure reliable information that may develop facts of great importance to the lake shipping interests. The several measures which he has introduced in congress on the subject were accordingly endorsed with little comment.

IN MEMORY OF GEN. POE.

In accordance with the special order for Thursday morning the first business taken up was that of paying tribute to the memory of the late Gen. Poe. "We owe it to the memory of Gen. Poe" said Mr. Goulder, "to take some action towards placing a bronze tablet or some other memorial commemorative of him at the Sault canal." Mr. Goulder had no definite proposition to submit, but introduced Gen. R. A. Alger, who was a close personal

friend of Detroit's well known army officer. Gen. Alger spoke at length of his acquaintance with Gen. Poe and the many grand qualities of which he was possessed.

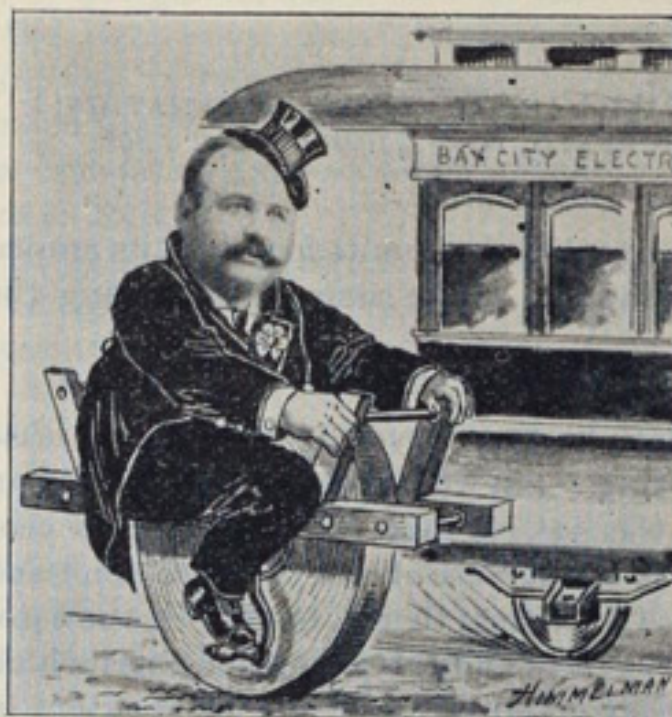


Illustration of the story told about John Mitchell.

Gen. Sherman had said of him that he was the most conscientious man he ever knew. Distressing and sudden grief had fallen to Mrs. Poe and her daughter in the loss first of a young son in the family, then a daughter, later on a son that was the pride of the family, and last a father who was about to see the crowning results of a life's best efforts. Mrs. Poe and her daughter had strenuously opposed any offers of assistance, but the matter of sentiment should be overruled, Gen. Alger

thought, and a resolution was adopted endorsing the bill introduced by Senator McMillan providing for a pension of \$100 a month for Mrs. Poe.

Mr. Goulder read a letter which he received in May last from Gen. Poe. He treasures it. He made a speech at the chamber of commerce banquet in Cleveland, in which he referred in praiseworthy terms to the work of Gen. Poe in behalf of lake interests. Gen. Poe read Mr. Goulder's speech in one of the Detroit newspapers and then wrote him referring to his kind and flattering remarks. "I beg to assure you," he said, "of my high appreciation of, and gratitude for your good opinion. While I can not but feel that you overestimate the value of my work, yet your reference to it in such complimentary terms upon that occasion, and before that audience carried with it ample compensation for whatever aid I may have rendered to a purpose for which I have devoted every faculty at my command. If I have succeeded in gaining the confidence of the marine interests, and continue to satisfy them for the short time of active service remaining to me, I shall have accomplished my highest ambition."

Mr. Livingstone moved the appointment of a committee to collect a fund for the erection of a statue of Gen. Poe or other suitable memorial at Sault Ste. Marie, and the chair appointed members of the committee Wm. Livingstone and R. A. Alger of Detroit, M. A. Hanna and J. C. Gilchrist of Cleveland, S. D. Caldwell and E. T. Evans of Buffalo, C. W. Elphicke of Chicago, Thomas Cranage of Saginaw, Alex McDougall of Duluth and David Vance of Milwaukee. Gen. Alger said he was pleased with the idea of a statue but suggested that it would cost \$10,000. Mr. Livingstone said "What of it?" and then Gen. Alger added that if a statue was to be erected he would head the subscription list with \$500.

MISSCELLANEOUS MATTERS.

Two resolutions which were intended to discourage the practice of vessel brokers contracting to carry large quantities of coal and ore and then working these contracts off on vessels applying for single loads were introduced and both were adopted. One was by Mr. G. G. Hadley of Toledo and the other by John Corrigan of Cleveland. Mr. Hadley's resolution simply condemned the practice. Mr. Corrigan's resolution referred to it as ruinous to the vessel interests and declared that in all cases where contracts are made the vessels should be named.

The committee appointed to consider various features of the fuel question reported progress but announced that they would be unable to make a report prior to adjournment. The committee was, therefore, upon motion of Mr. A. A. Parker, made a permanent committee with power to act for the association.

Capt. Geo. P. McKay, has been at work for some time past securing signatures to a petition to the Canadian government, which asks for several important changes in lights and other aids to navigation in the vicinity of Point au Pelee, Lake Erie. The changes sought by Capt. McKay were endorsed, and the executive officers of the association were authorized to visit Ottawa if they see fit in their efforts to have the improvements carried out.

Other resolutions that were adopted follow: By Mr. Livingstone, deploring the death of Capt. John Shaw of Bay City; by J. W. Westcott, recommending increased width of channels in the St. Mary's river to 500 feet, in the Detroit river at the Lime-Kilns to 600 feet, and a second canal of 300 feet width at the St. Clair Flats; by Mr. Livingstone, endorsing the movement to establish branch hydrographic offices at Duluth, Sault Ste. Marie, Buffalo and Detroit; by John Corrigan, extending a vote of thanks to Supt. McKenzie at the Sault canal for efficient services; by Mr. Ricketson of Milwaukee, providing for a shipping office at that port; by Capt. Wm. S. Mack, requesting the Western Union Telegraph Co. to establish a telegraph station at Detour; by Capt. Alex. McDougall, recommending the repeal of all laws which compel vessels to make reports to collectors of customs or to army engineer officers in charge of river and harbor improvements.



Treas. McKay talks of his old charge—lights and other aids to navigation.



Capt. Peek merely looks in on the meeting.

Annual Report of Board of Managers.

Office of the LAKE CARRIERS' ASSOCIATION,
BUFFALO, N. Y., January 15, 1896.

To the Members of the Lake Carriers' Association:

The board of managers of the association submits herewith its annual report of the proceedings and operations of the association during the past year.

TONNAGE OF THE ASSOCIATION.

The membership of the association shows a very gratifying increase during the year which is just closing. For the year ending March 31, 1895 the tonnage of the association was 590,136 tons. For the current year the tonnage is 617,880 tons. This is an increase of nearly 30,000 tons, and the figures for the present year are the largest in the history of the association. Outside of the railroad ferry lines and the passenger lines which operate in certain localities where they do not share to any great extent in the benefits afforded by membership in the association, there are not 20 important vessels on the great lakes which are not now on our rolls. The board of managers is much gratified at this showing and feels that it affords a conclusive proof that the association is accomplishing valuable results.

FINANCES OF THE ASSOCIATION.

The annual dues for the current year remain at 3 cents per net registered ton, to which figure they were reduced at the annual meeting in 1894. The treasurer's report, which is submitted herewith, shows that these dues have been well paid up but that the income of the association has not been quite sufficient to meet all expenses. It is not necessary to review the treasurer's report in detail. It is enough to say that the uncollected dues, which his statement shows as \$462.99, have been reduced by later payments to a little over \$200.00, most of which will probably be collected, and that there is now a balance of about \$850.00 in the treasury, which will nearly provide for existing liabilities. Every year heretofore the treasurer has been compelled to borrow money at some time between the annual meeting and the first of May to meet the expenses incurred during the winter and before the new dues were paid in. We had hoped that this year we should not be compelled to do this, but the statement submitted shows that a small sum will have to be borrowed to tide over the interval until the income of the coming year is available. In 1894 the expenses of the association were quite rigorously cut and decided economies have been in force ever since. The current year has also, like the previous year been comparatively free from extraordinary and unforeseen expenses. The very low stage of water, however, compelled the association to establish some additional lights in the vicinity of Ballard's reef and at other points in the Detroit river, and these increased the expense of private lighting beyond the estimates. Aside from this, all expenses have been kept down to the lowest estimated requirements.

OPERATIONS OF THE SHIPPING OFFICES.

Shipping offices of the association have been maintained during the past year at Cleveland, Chicago, South Chicago, Buffalo, Ashtabula and Toledo. The following condensed report, taken from the annual report of Shipping Master Rumsey, shows the number of men placed on board vessels at each of these points as follows: There have been no complaints from members of unsatisfactory service at any of the shipping offices:

Put on board at Cleveland.....	2,871
Sent from Cleveland to other ports.....	530
Put on board at Chicago.....	2,861
Sent from Chicago to other ports.....	112
Put on board at South Chicago.....	2,494
Put on board at Buffalo and Tonawanda.....	2,300
Put on board at Ashtabula.....	1,892
Sent from Ashtabula to other ports.....	160
Put on board at Toledo.....	755
Total.....	13,975

The total number of men shipped during the past season shows an increase of 3,919 over the season of 1894. This is an increase of 40 per cent. and shows that the use of the shipping offices by members is growing very rapidly. The greatest increases in 1895 has been at South Chicago and Buffalo.

THE FUELING AGREEMENT.

In reviewing the operations of the past year, the first place should, perhaps, be given to the important work projected at the last annual meeting in reforming the practices prevailing at the port of Buffalo in supplying steamers with fuel. This matter occupied so much time and attention at the last annual meeting that it is not necessary to set out in full either the abuses which had gradually grown up in connection with fueling at Buffalo or the various methods which were proposed to the asso-

ciation for the purpose of reforming such practices. It is sufficient to say that at last year's meeting the committee on fueling presented a report which was adopted by the meeting, in which they recommended that vessel owners on the lakes whose vessels carried coal cargoes out of Buffalo should sign an agreement pledging themselves each to the other that under no circumstances would they purchase fuel for their steamers directly or indirectly from any shipper of hard coal. Such an agreement was prepared and largely signed by those present at the last annual meeting. After the meeting the committee on fueling circulated the contract among vessel owners generally and succeeded in securing the signature of so large a proportion of the tonnage which is engaged in carrying hard coal out of Buffalo that the plan was declared operative, and all signers of the agreement were notified that the necessary tonnage had been secured and that they were expected to live up to the contract in all particulars. It was not expected that a victory could be won in this matter without a long hard fight. The shippers of hard coal and their agents, who had exacted as a condition of chartering a vessel to carry hard coal that they or some person designated by them should have the privilege of fueling the vessel at a price 40 or 50 cents above the price at which soft coal firms stood ready to furnish the same or better fuel, would not willingly see a practice so decidedly for their advantage go out of existence. Circumstances, however, were on the whole favorable to the vessel owners. During the early part of the season the movement of grain to Buffalo was light, so that a comparatively small number of vessels outside the line boats visited that port. There was, therefore, no great competition to secure charters for carrying coal. Later in the year when the grain trade became active and the number of vessels desiring coal charters became numerous, the requirements of the coal shippers became large and pressing, and the amount of coal to be forwarded was unusually great. In addition to these favoring circumstances, the vessel owners had the very great advantage afforded to them by the skill, care and constant vigilance exercised in their behalf by Mr. J. J. H. Brown, the Buffalo member of the fueling committee. Capt. Brown was in a position to know exactly what was going on in the matter of chartering for coal. He kept the closest watch of every phase of the struggle between the vessel owners and the coal shippers and was always on the alert to detect the slightest sign of weakness on the part of the vessels and to keep vessel owners promptly advised of every occurrence however slight which had any bearing on the controversy. The amount of time, patience and skill which he gave to the matter can scarcely be overstated, and the board of managers desires to express in its annual report the very great obligations of all vessel owners to him for the generalship which he showed in conducting this struggle on their behalf. The result of this combination of favorable circumstances and skillful leadership was a complete victory on the part of the vessel owners. During all the latter part of the season vessels were freely chartered for coal without the slightest pressure put upon them to buy their fuel at any particular place. On the contrary, the vessels fueled where they chose, and at a price far below that prevailing in previous seasons. Good three-quarter lump coal was placed in the bunkers of steamers at from \$2.10 to \$2.20 per ton, as against a price of \$2.60 per ton in 1894 for fuel which has been described as "anything that was black." It is estimated that the money saving to vessel owners during the season of 1895 in the price of fuel at Buffalo was over \$50,000; and it is believed that the exactions which prevailed in the season of 1894 and preceding years have been permanently ended.

During the latter part of the past season the hard coal shippers freely offered fuel to vessels at the same price at which it was furnished by the soft coal dealers. Under the agreement which vessel owners had signed, however, vessels were not free to fuel with the shipper even on the same terms at which fuel was offered by the regular fueling docks. An important question to come before the annual meeting this year will be to determine the course to be followed during the season of 1896. Two possible courses lie open. First, to enter into a new agreement similar to that of last year, whereby vessels bind themselves not to take fuel from any shipper of hard coal. Second, to raise, what has been called by the hard coal shippers, the "boycott," upon them, upon the distinct understanding that vessels shall be free to fuel with the hard coal shipper or with the soft coal firm, as they choose, and that under no circumstances shall the hard coal shipper exact a price for fuel over and above that at which the soft coal firms are ready to furnish it, it being also understood that as soon as there is any indication that the charter of any vessel for hard coal is in any way dependent or conditional upon her fueling, the agreement of last year shall be revived and all fueling with shippers or their agents shall cease.

GRAIN SHOVELLING AT BUFFALO.

In 1893 the scale of charges for shovelling grain at the port of Buffalo was as follows:

For Steamers.—For grain in the hold.....	\$4.00 per 1000 bush.
For grain between decks.....	4.50 " " "
For wet or damaged grain.....	10.00 " " "
For Sailing Vessels.—\$3.50 per 1000 bushels for grain in good condition, and \$10.00 per 1000 for wet and damaged grain.	

A reduction in these charges was obtained so that in 1894 the rate for shovelling grain in the hold of steamers was reduced from \$4.00 per 1000 to \$3.75, the other prices remaining as before. The matter of a further reduction in the grain shovelling charges at the port of Buffalo was brought up at the last annual meeting and a committee, of which Captain J. J. H. Brown, of Buffalo, was chairman, was appointed to see what could be done in the matter. Under the guidance of its chairman, this committee adopted and put into operation a plan for shovelling grain at Buffalo which is entirely new and which has proved itself during the season of navigation just closed a complete success.

Before the opening of navigation a contract was entered into between the Lake Carriers' Association and James Kennedy of Buffalo, N. Y., whereby Mr. Kennedy contracted and agreed to do all the shovelling of grain out of vessels of the Association during the season of 1895 at the uniform rate of \$3.50 per 1,000 bushels, irrespective of the kind and condition of the grain and of its situation in the vessel, and with no distinction between steam and sail vessels. In order to show just what has been saved to vessels under the operation of this contract a statement has been obtained from Mr. Kennedy showing his operations under the contract during the past year. A summary of this statement is as follows: During the past season there was shovelled at the port of Buffalo 121,225,497 bushels of grain. Of this, 103,225,497 bushels was grain in good condition carried in the hold of vessels; 15,000,000 bushels was grain in good condition carried on deck, and 3,000,000 bushels was wet or damaged grain. On the grain in good condition, carried in the hold, the charge for shovelling was \$3.50 per 1000 as against \$3.75 per 1000 in 1894 and \$4.00 per 1000 in 1893. Calculating the saving only for the difference between 1894 and 1895, namely, 25 cents per 1000, the shovelling charges on this grain was reduced under the operations of Mr. Kennedy's contract \$25,806.00. On the grain carried on deck there was a saving of \$1.00 per 1000, or \$15,000.00 in all, and on the wet and damaged grain there was a saving of \$6.50 per 1000, or \$19,500.00 in all, making a total saving to vessels of \$60,306.00. This, however, is far from showing the real advantage to vessels derived from this contract. It is conceded that the work of shoveling grain in vessels has never been so satisfactorily performed as during the past season. In former years it was the practice to stop work precisely at midnight on Saturday night, even if only a small remnant of grain was left in the vessel. In such cases the process of unloading was finished on the following Monday. During the season just closed it has been the uniform practice to finish unloading all vessels where the process was once begun. This has resulted in a large saving of time to many vessels during the season. In addition to this, the contract system of shoveling grain has done away with a number of practices which had grown up in the business, which tended to send vessels having cargoes consisting of several different lots of grain to as many different elevators. Under the present system much less shifting of vessels during the process of unloading is necessary, and valuable time, as well as tow bills, have been thereby saved.

EXTRA PRIVATE LIGHTING AND MARKING OF CHANNELS, DURING THE PAST SEASON.

Besides maintaining the usual number of private lights on the Canadian side of the Detroit river, the association was compelled during the season just closed, by the extraordinary low stage of the water and the consequent groundings and difficulties experienced by vessels at new points in the Detroit river, to expend about \$900 extra for additional stakes, buoys and lights. These additional marks were placed under the direction of Capt. George P. McKay, the efficient chairman of the committee on aids to navigation. The result of establishing them was a large decrease in the number of accidents in their locality and afforded positive proof that exactly the right thing had been done. On August 20, 1895, Capt. McKay superintended the placing of the following marks: A black stake on Briton shoal; a float light on the foot of Bois Blanc island; a float light on Boston shoal; a float light on New York shoal; a float light and black stake directly opposite Amherstburg, Ont. On the 21st of October, 1895, Capt. McKay placed six float lights and six black stakes and one red stake between the Lime Kiln crossing and Ballard's reef. On the night of October 20, just previous to Capt. McKay's arrival at this point, the steamer "Waldo Avery" had struck there and was leaking badly. The steamer "John Craig" was sunk, and several others had experienced trouble. Capt. McKay was obliged to act promptly in the matter to avoid further disasters, and the stakes and lights above referred to were ordered placed by him on his own authority. It is enough to say that the finance committee promptly ratified Capt. McKay's action and that there were no more complaints of accidents and disasters at this point. This result was as beneficial to the underwriters as to vessel owners, and the underwriters will be asked to share the extra expense with the Lake Carriers' Association.

NEW AIDS TO NAVIGATION ON THE GREAT LAKES.

In October, 1895, the president and the secretary of the association consulted with the officers of the light-house board at Washington with reference to the establishment of a number of new aids to navigation on the

great lakes. They took with them to Washington a short list of proposed new lights and signals, prepared under the direction of the committee on aids to navigation, and went over each item very carefully with the officers of the light-house board, hoping thereby to secure the support of the board and to have the proposed new lights included in the list recommended by the light-house board for construction, and included in the annual estimates of the secretary of the treasury. The proposed new lights were as follows:

A light and fog signal on Middle island, Lake Huron.

A light and fog signal at Crisp's point, west of Whitefish point, Lake Superior.

A light and fog signal on St. Martin's reef, Lake Huron.

A light and fog signal on Rock of Ages, Isle Royale, Lake Superior.

In addition to these new lights we asked that the fog signal at Marquette be located on a crib just inside the end of the pier at that point, instead of on the shore, at a considerable distance from the pier, where it is now placed. We also asked for the placing of gas buoys as follows:

1st. On Graham shoal, Straits of Mackinaw.

2nd. On the easterly side of the channel near Grosse point, half way between light ship and tripod.

3rd. On southerly point of Fish island.

4th. At three points in the St. Mary's river above the canal, as shown on a chart presented to the board.

5th. On the shoal at the south-east point of North Manitou island, until completion of light-house at that point.

When the annual estimates of the treasury department were submitted to congress we were greatly disappointed to find that none of these new lights, which are most urgently needed, were included in the estimates for appropriation at the present session of congress. In spite of this discouraging failure to secure the hearty support of the light-house board in an attempt to increase the efficiency of the light-house service on the lakes, the association hopes to obtain appropriations for a number of these aids to navigation. A bill authorizing them and appropriating the necessary money will be introduced in congress within a few days, and the light-house board will be called upon for a report as to the necessity of each of these lights. As the board is on record in past years as favoring some of these lights, it is believed that they will certify to the necessity of some, if not all, of them, and a determined effort will then be made to secure appropriation in the senate for as many as possible. At the last session of congress, largely by the efforts of Senator McMillan, the appropriation made by the house for general buoyage was increased in the senate, and the wording of the act changed so as to permit the purchase of gas buoys out of the amount so appropriated. The association was informed by the light-house board that a certain number of these gas buoys would be put in service in the great lakes. During the year one of these gas buoys was put in operation in the harbor at Erie, Pa., where it has given the greatest satisfaction. The board also announced its determination to locate buoys at Lansing shoal, north of Squaw island, Lake Michigan, and at Poverty Passage, Green Bay, but it is understood that the buoys for these points, which are manufactured in Germany, were not completed in time to make it worth while to place them during the past season. They will, however, be placed at the opening of navigation, 1896. It is hoped also that the light-house board will see its way clear to place some additional gas buoys out of this year's appropriation for buoyage at some of the other points recommended by the association.

There has been a very exasperating delay in the construction of the light-house at North Manitou island. Although the appropriation for this light was made last winter, nothing has been done towards building it. It is understood that no owner can be found who can give the government a title to the land where the light is to be located. As the light-house board is forbidden to construct a light-house except upon property to which the United States has a perfect title, the board has been powerless to act. The United States district attorney for the district in which the light is located has been instructed to commence condemnation proceedings to acquire title to the property, and unless some special legislation is obtained, the construction of the light can not begin until these proceedings are terminated. It is understood that in some special cases permission has been given to construct lights upon land to which no one claimed title. Unless the condemnation proceedings in this case are likely to reach a speedy termination, an effort will be made to secure authority to proceed in this case; and failing in this the light-house board will be asked to place a gas buoy at the point in question until the light is ready for operation.

REMOVAL OF LIGHTS AND BUOYS BEFORE CLOSE OF NAVIGATION.

The high rates of freight which prevailed during the latter part of the season of 1895 kept the entire lake fleet in commission until navigation was closed by ice. Nevertheless, although practically every large vessel on the lakes was in commission, some of the most important lights were extinguished, and the work of removing buoys went on as in former years. This is a very difficult matter to deal with, and probably it will always be necessary that the work of removing the buoys should be at least commenced before the actual close of navigation. Nevertheless, there were instances

during the season just closed which show how unsatisfactory are the present methods of the light-house authorities in dealing with this matter. There does not seem to be any good reason why an important light like that on Stannard's rock, Lake Superior, a light which cost the government nearly \$400,000, should be extinguished fully two weeks before the close of navigation, and at a time when the whole lake fleet is most actively engaged. It will be remembered that a few years ago the light-ships at the west end of the Straits of Mackinaw were removed some time before the close of navigation, and that they were ordered back again to their stations by direction of the light-house board. While, perhaps, it is impossible for the light-house board to fix beforehand a date at which the important lights should be extinguished and ship-lights removed, it would appear that at present too much is left to the discretion of the light-keepers, whose timidity or desire to finish their season's work doubtless sometimes leads to the extinguishment of very important lights before there is any necessity therefor. In the matter of the removal of buoys a typical instance may be given showing how the present system works. On the 25th day of November, 1895, the secretary of the association received a telegram from the general manager of the Ogdensburg Transit Co., stating that notice had been given that the St. Lawrence river buoys would be removed immediately. As a number of boats of the Ogdensburg line were yet to go down the river, and as the weather was mild, navigation in full swing and there was no apparent necessity for the immediate removal of the buoys, which the boats in question greatly needed in order to run the river safely, the transit company asked that an effort be made to have the removal of the buoys postponed. Telegrams stating the facts were accordingly sent to the light-house board and to the inspector of the light-house district in which the buoys in question were located. After a day or two's delay the light-house board replied that they could not interfere with the discretion of the local officers in such matters. The inspector replied promptly, furnishing to the association a copy of a telegram immediately sent by him to the buoy contractor for the St. Lawrence river, who resides at Cape Vincent, N. Y. In his dispatch to this contractor the inspector, Capt. Gridley, stated the facts with regard to the boats of the transit company still in commission, and directed the buoy contractor to leave the buoys until the last possible moment. It was believed that this prompt action of the inspector would secure the desired result, and the transit company was notified immediately of the inspector's action. The buoy contractor, however, proceeded to remove the buoys immediately, although navigation did not close for at least ten days thereafter. As these aids to navigation are furnished by the government for the protection of vessels, which never need them more than during the last days of navigation, it is believed that vessel owners have just ground to criticise the present system respecting their early removal, and to ask the light-house board to devise some better method of dealing with the matter, a method which shall leave less to the discretion of light-keepers and contractors, whose interest is to get through with their work, and which shall have more regard to the protection of the life and property for the safety of which the buoys exist.

DEATH OF GENERAL POE.

During the past year the members of the association have experienced an inestimable loss in the death of the distinguished engineer officer whose name will be forever connected with the improvement of the lake channels and the development of inland transportation in the United States. The death of Gen. Poe was felt as a profound sorrow by every vessel owner. He was regarded as a tower of strength in all matters that pertained to the protection of the lake waterways and to their progressive development and improvement in the interest of a still greater transportation service. In addition to this, Gen. Poe had become a universal umpire in all matters of dispute in which the interests of vessel owners came into conflict with other interests. His accurate knowledge and his absolute fairness and probity were so universally recognized that he was not only in all cases the chairman of the board selected to pass upon such disputed questions, but the conclusions which were reached by him were recognized in nearly every case, even by the defeated party, as a fair and just disposition of the matter at issue. However able and accomplished the successor of Gen. Poe may be it must be a long time before he will be able to acquire so profound a knowledge of all the details of the lake transportation, and it will be particularly difficult for him to acquire that comprehensive view of all the elements which go to make up the greatness of the carrying business done on the great lakes which was so characteristic of his lamented predecessor and which gave him so genuine an enthusiasm for all the great projects which he originated and to which he gave so many of the best years of his life. Gen. Poe's influence with vessel owners, great as it was, was no greater than his influence with his superior officers and with congress; and his splendid presence and fine personality gave all that he said a weight which can hardly be overestimated. In his death the vessel owners have lost their most powerful advocate, as well as a friend for whom they had the greatest respect and affection.

THE CHICAGO DRAINAGE CANAL.

During the past year the secretary of war appointed a commission of engineers, of which the late Gen. Poe was chairman, to examine into and

report upon the probable effect of the operation of the Chicago drainage canal upon the water levels of the great lakes. This board made a report, preliminary in its nature, in which they expressed the opinion that the operation of the canal would have a considerable effect in lowering the levels of the lakes below Lake Superior, stating, however, that further examinations and surveys would have to be made before the amount of such lowering could be definitely ascertained. The board concluded its report by recommending that such further observations be ordered.

The extraordinary low stage of water prevailing during the present season, and the belief that a still further lowering of the water levels will be caused by the operations of the Chicago canal, have attracted a great deal of attention from all parties connected with lake navigation during the past summer. The large amount of discussion in the public press upon this subject is the best evidence of the widespread interest which is felt in it. Latterly the discussion has largely turned upon the possibility of restoring the water levels on the lakes to their normal stage, or even to a higher stage, and of maintaining these levels hereafter uniformly at a fixed point by means of the construction of a system of dams at various points on the chain of lakes. The very great advantages of such a system of controlling the lake levels, if the same is found practicable, are easily apparent. While it is a disputed question as to whether there are permanent climatic changes or permanent changes in the channels connecting the great lakes which are now operating to lower lake levels, there are some very good reasons for believing that no permanent lowering of the great lakes has taken place by reason of either of the causes above named. While the water is now extraordinarily low it was extraordinarily high so late as 1886. In fact at no time since 1859 has the water on Lake Michigan and Lake Huron been so high as it was in 1886. However this may be, it is an unquestioned fact that the operation of the Chicago drainage canal will have more or less effect in permanently lowering the lake levels, and it is also a well known fact that between the high water of 1886 and the low water now prevailing there is a difference of at least 3 feet. The adoption of a system of control at the outlets of the various lakes which would prevent wide fluctuations between different seasons and maintain the lake levels at the point which they have heretofore reached during seasons of high water, would be of inestimable benefit. The very great advantages too of a construction which would operate not only to deepen the connecting channels between the lakes but at the same time to deepen all the harbors correspondingly, are also obvious. While the United States engineers have not in the past been especially favorable to the proposed method of control by dams, there are indications that a change of opinion is going on in this respect and that a number of government engineers now stationed on the great lakes are looking very hopefully towards a solution of the problem of deep water by the use of this method. Resolutions have been introduced in both houses of congress calling for the necessary observations, surveys and estimates, and it is believed that the association may well give its hearty support to a project which if found practicable will do so much for the development of our waterways.

MISCELLANEOUS EVENTS DURING THE PAST YEAR.

Among other occurrences during the past year which do not require extended comment but should be mentioned, is the holding of a deep water convention in Cleveland and the large amount of information relative to commerce of the great lakes which has been diffused by the press of the entire country, largely as a result of the interest attaching to the proceedings of this convention. It is also important to note that in November, 1895, the state of New York by a large popular majority voted to expend immediately the sum of \$9,000,000 in deepening and improving the Erie canal. The design is to give an additional depth of 1 foot of water over all culverts, locks and permanent structures, and an additional depth of 2 feet at all other points in the canal. It is believed that this will enable the class of boats now used on the canal to increase their cargoes by about 25 per cent. and to increase their speed to an even greater degree. The advocates of this improvement claim that thereby the canal will be enabled to carry grain from Buffalo to the seaboard at lower rates than heretofore. As deep water navigation now ends at Buffalo, and as a large amount of the lake traffic, particularly in grain, is destined for the seaboard, an improvement which will result in lowering the through rate on such traffic from the west to the seaboard is of importance to vessel owners, as it tends to the development of the business and to successful competition on the part of the water route with other methods of transportation.

BUSINESS RELATING TO THE COMING YEAR.

In addition to a number of matters above referred to in connection with last year's events which will require further consideration, there are numerous matters now in sight which will require careful management through the general and special committees of the association during the coming year.

DETROIT RIVER BRIDGE.

A bill has been introduced in both branches of congress to authorize the construction of a bridge across the Detroit river within the limits of

the city of Detroit. The bridge proposed is to consist of three spans, with two piers in the river, each about 600 feet from the shore, with a span 1,100 feet clear between these piers. The bridge is to be 140 feet above the water. It is believed that a determined effort will be made by the advocates of this bridge to secure its authorization by congress. At the time when the matter of bridging the Detroit river was last actively pushed an attempt was made to secure the authorization of a so-called winter bridge. At that time the matter was referred to a board of engineers, of which Gen. Poe was chairman, and a report was made by that board against the winter bridge. The board, however, went on in its report to say that a certain type of bridge might be constructed which would not in its opinion be a serious obstruction. It is understood that the pending bill is drawn to meet this portion of the engineers' report, and the promoters of the bridge undoubtedly hope to secure the endorsement of the war department on the ground that the bridge they propose meets the requirements of the board of engineers, which last reported on the subject. Since then, however, the tunnel at Port Huron has been successfully constructed, and it is believed also that there has been progress in the art of bridge building which makes the old report of the engineers inapplicable to the present day. In addition to this, the commerce of the Detroit river has very greatly increased, so that now the traffic through the river is much greater than through any waterway in the world. It is interesting also to know that two years ago application was made to congress for the construction of a bridge across the Hudson river from a point in the upper part of New York city to a corresponding point on the New Jersey shore, and that after a very sharp contest in congress a bill authorizing a bridge with a clear span much greater than that proposed for Detroit was vetoed by the president, and when a subsequent bill providing for a bridge at this point was passed which left it to the war department to determine the character of bridge which should be built, the department reported, after thorough examination, against the placing of any piers in the river and in favor of requiring a suspension bridge at the point in question which should do away entirely with any abutments beyond the pier lines. As the commerce at this point in the Hudson river is small compared with that which exists in the Detroit river, and can never, so far as can now be foreseen, reach any such dimensions as that already attained at Detroit, it is not believed that congress and the war department will now authorize the placing of artificial obstructions in the channel at Detroit, especially since the successful completion of the tunnel between Port Huron and Sarnia. Unquestionably, however, the vessel interests will have to make a very vigorous opposition to the proposed bridge, and it is very desirable that at the annual meeting of the association the matter should be discussed and the course of action to be pursued determined.

PROPOSED REGULATIONS FOR THE NAVIGATION OF THE ST. MARY'S RIVER.

It has been suggested that, inasmuch as navigation in the artificial channels in the St. Mary's river is now carried on under regulations prescribed by the government engineers in charge of the improvements there, it would be a desirable thing to have the jurisdiction of these engineer officers extended to cover all that portion of the St. Mary's river in which navigation is difficult, and that the necessary authority should be placed in the hands of such engineers to enable them to make rules and regulations to govern all kinds of vessels, as well as rafts, while navigating such parts of the river. It is believed that any regulations that would thus be made would be decidedly in the interest of safety, and that they would largely do away with the collisions and groundings, now so frequent in the river and would greatly lessen the risk of a complete stoppage of navigation, a disaster which is so possible that it is always in the minds of vessel owners. It would be impossible, by such regulations, to cover Canadian vessels while in Canadian waters, unless the co-operation of the Canadian government could be obtained; but if such regulations could be made applicable to all American vessels, whether in American or Canadian waters, and to all Canadian vessels while in American waters, the application of the rule would be so general that the exceptions might be disregarded. Of course, if vessel owners voluntarily subject themselves to such regulations, it must be upon the condition that rafts also be subject to the same jurisdiction, and that power to make regulations governing them also be given to the engineers. The adoption of such a system, also, should be conditional upon some proper method of enforcing the regulations so made, by a system of fines. Probably the revenue marine service would afford the best machinery for detecting offenders and securing general obedience to the rules so made.

The adoption of such a system, if well carried out, would largely do away with reckless navigation of the river and would also, in large part, solve the vexed question of regulating rafts; although, of course, it would still leave the raft question unsettled in the St. Clair and Detroit rivers.

THE RAFT BILL.

It is the intention of the present board of managers of the association to push vigorously the raft legislation which has been so long advocated by the association and which has not yet been secured. If the new officers and board of managers shall be of like mind we believe that this vexed question can be settled at this session of congress. Steps have already been taken to put the matter in shape for vigorous action after the annual meeting.

LIBELLING VESSELS FOR SMALL CLAIMS.

For a number of years past vessel owners have complained greatly that a system of blackmail was carried on at various ports on the great lakes whereby trifling, unjust claims were presented to the masters of their vessels, and unless payment was immediately made the boats were libelled

and the vessel compelled to pay a bill which had no merit or basis whatever, simply because it was so small that it was cheaper to pay than to submit to the delays and expenses incident to a refusal. One vessel owner assured me that he was certain that in at least 100 cases which had been called to his attention he had advised the payment of claims which appeared to have no merit whatever, as the cheapest course for the vessel owner to pursue. A number of members of the association have asked that this matter receive the attention of the annual meeting; and in order that some preparation might be made for an intelligent comprehension of the questions involved, the counsel of the association has been asked to give the matter thought and to suggest to the meeting the best course to be pursued in endeavoring to put an end to this abuse. Mr. Goulder has accordingly looked carefully into the matter and will give the annual meeting the benefit of his ideas on this important question. He believes that the difficulty can be in large part met, and it will probably be the pleasure of the meeting to provide for the appointment of a small special committee to take the matter up upon the lines suggested by the counsel of the association.

DEPUTY COLLECTORS OF CUSTOMS AT DULUTH.

During the past year a large number of vessels belonging to the association have complained that they were subject to considerable delays in obtaining clearances from Duluth when loading ore at the Mesabi docks at that port. These docks are located several miles from the office of the collector of customs, there being infrequent street car service between the two points during the day and no service at all during the night. Masters complain that they are obliged to leave their vessels when the process of loading is going on, although they ought to be on hand at that time, and to spend sometimes several hours in getting their clearances. As these docks shipped about a million and a half tons of ore during the season just closed, a business which in itself exceeds that of nine-tenths of the ports on the lakes where customs officers are located, it seems reasonable to ask that arrangements be made to have a deputy collector at the dock both night and day to give clearances to vessels. It is understood that the dock authorities will provide quarters for such collectors without expense to the government and that the government will be at no expense in the matter except for the salaries of the officers themselves. The matter was called to the attention of the treasury department during the past year, and just before the close of navigation the department offered to place officers there if the Lake Carriers' Association would pay their salaries. This method did not commend itself to the managers of the association as a proper solution of the difficulty. It is believed that if proper representations are made by vessel owners to the treasury department the desired relief can be obtained and that the government will place the necessary officers at the dock during the coming season of navigation.

PROPOSED CONFERENCE WITH CANADIAN AUTHORITIES.

During the past year a great deal of trouble has been experienced by vessels in the vicinity of Pointe au Pelee, Lake Erie. Various changes and additions are imperatively required in the matter of aids to navigation in that vicinity. As this locality, however, is in Canadian waters nothing can be done without the co-operation of the Canadian authorities. A petition stating the requirements of the situation has been circulated amongst vessel owners at various lake ports and very extensively signed. It is believed that some relief might be obtained if a small committee were authorized by the annual meeting to take the matter in charge and to visit Ottawa and confer with the various authorities there in the hope of securing some, if not all, of the relief necessary. At the same time this committee might well take up, with the proper authority at Ottawa, another matter which has called forth considerable complaint. In the district covered by the Canadian collector of customs at Amherstburg, whenever an American vessel gets into trouble anywhere in his district, and any lightering of cargo has to be done, which is frequently the case from groundings at Bar point, Ballard's reef, and even as far as Pointe au Pelee, the Amherstburg collector insists that one of his officers shall be aboard when either the lightering or the reloading of vessels is to be done within the boundaries of his district. In such cases the vessel pays the officer a certain amount per hour for the time that the man is aboard. If the trouble in question occurs in the middle of the night, nothing can be done until the collector has been found and the officer placed aboard. In this way the vessel is often subjected to a considerable loss of time and much inconvenience. The officer on board exacts pay by the hour both night and day, irrespective of whether he is occupied during the night or not. It is understood that no such rule is in operation at other Canadian ports. Neither the collector at Windsor nor the collector at Sarnia makes any such requirements, and there is a strong belief that the collector at Amherstburg is entirely unwarranted in pursuing this course. The matter should be called to the attention of the Ottawa authorities, and if the Amherstburg collector is going beyond the requirements of law he should be brought up with a round turn.

Doubtless other matters, not covered in this report, will come up for discussion at the annual meeting, but the board of managers has endeavored to give you herein a comprehensive review of what has been accomplished during the past year and of the pending problems to be taken up by the incoming board.

In conclusion, your board of managers congratulates you upon the prosperous condition of the association and upon the hearty support which has been extended to the board from all vessel owners during the past year. The events of this year have proved that vessel owners have become more than ever before a united body, capable of dealing unitedly with all matters of common concern, able to stand together and to carry out to the end a course mapped out for them by their elected representatives on the board of managers of this association, and possessed of a new confidence in themselves as a body. We ask for our successors in office the same hearty support which we have ourselves received. We predict that they will receive the same support and that they will accomplish whatever they set out to do in reforming abuses and contributing to the prosperity of the merchant marine of the great lakes.

Respectfully submitted on behalf of the Board of Managers, by

WILLIAM LIVINGSTON, President,
CHARLES H. KEEP, Secretary.

Shipbuilders, Dry Dock Managers and Underwriters.

Meetings of representatives of three other lake interests were held in Detroit while the Lake Carriers were in session. The builders of steel vessels were all represented at a meeting that was called on account of labor troubles at the Chicago and Buffalo yards. The main object was to discuss the matter of riveters' wages, although the wages of metal workers generally in the ship yards was under consideration. It was found that wages aside from the riveters were quite uniform, and after an extended discussion a scale of wages for the riveters, covering practically all of different kinds of work was agreed upon.

The dry docks of the lakes were all represented at the annual meeting of the association representing this interest. Edward Gaskin of Buffalo was elected president, W. I. Babcock of Chicago vice-president and H. J. Mills of Buffalo secretary and treasurer. The regular schedule of dock charges was not changed, and it was agreed that hereafter, lay time charges would begin immediately upon conclusion of the first twenty-four hours in dock. In some cases no extra charge was made when a vessel was in dock only a short period after the first twenty-four hours. It was also agreed to return to the practice of charging full 10 cents a ton for cargo in cases where vessels were docked with cargo. Resolutions referring to the death of John C. Parker of the Detroit Dry Dock Co. were adopted. The meeting of the association a year hence will be held in Chicago.

The general agents of insurance companies doing business on the lakes also met at the Russell house, and in this case also there was a full representation. The principal subject of discussion was a more thorough inspection and classification of steel vessels, and it is understood that the underwriters were engaged mainly, during their first session on Thursday, in considering the matter of appointing Capt. F. D. Herriman to the position of inspector of steel hulls. They are desirous of entering upon a more thorough system of classification than they have had in the past. There will be nothing definite as to rates or agreements for next season until the question of classification and the publication of a revised register is settled.

A committee, of which Capt. Wm. Mack was chairman, and which was appointed to take up with Capt. Davis of the revenue marine service the matter of regulating navigation in the St. Mary's river, presented a resolution recommending that the treasury department be called upon to establish suitable, reasonable and practical regulations for the guidance of vessels navigating the river. It was understood that the captains at their meeting in Washington would deal with proposed rules for Sault river navigation, as vessel owners contented themselves with simply endorsing the movement, leaving the rules to the men who handle the ships.

Grain shortages were talked of and a committee appointed on the subject. The committee returned a report saying that in proportion to the business handled the shortages had been reduced wonderfully during the past few years and may be still further reduced if vessel owners will employ only such weighmasters as are appointed by commercial bodies at the different grain receiving points.

Opposed to Piers of any Kind in the Channel.

The committee appointed to prepare statistics of Detroit river commerce, submitted a report which places the total commerce passing Detroit in 1895 at 29,860,335 net tons. On an average haul of 750 miles, the ton-mileage would, therefore, be 22,395,251,250. The cost per ton per mile, was stated in the report at eight and a half tenths of a mill. The average cost per ton per mile on freight moved through the St. Mary's Falls canal in 1894 was nine-tenths of a mill. In commenting on the report, Mr. Goulder said that the ton-mileage of all of the railways of the country, in 1894, was a shade over 83,000,000,000, so that the Detroit river traffic is considerably more than one-fourth as large as the railway traffic of the entire country. The cheapest figure at which freight was moved on any of the railways, he said, was 5½ mills per ton per mile, and 8½ mills per ton per mile was an average for all the railways. The association went into executive session on the bridge question, but the vessel owners were nearly all of one opinion, and there was little delay in reaching a conclusion. It was agreed to oppose the erection of a pier or piers of any kind in the navigable channel. The executive officers were authorized to select a committee to represent the association at the hearings in the matter that may be arranged by either branch of congress. The first hearing will probably be before the senate committee on commerce on January 30.

Ten Representative Lake Steamers.

The photo-chromotype illustration of ten representative steamers published with this issue of the REVIEW is a work of art as well as an illustration of the different type of craft that make up the lake fleet. A publisher recently asked how the REVIEW could afford to present such handsome supplements. The REVIEW can afford anything that will maintain its well-known position as the representative illustrated marine paper of the great lakes.

10,429,037 TONS FOR 1895.

COMPLETE STATISTICS OF LAKE SUPERIOR IRON ORE PRODUCTION—OUTPUT OF MINES, RANGES AND PORTS.

The output for 1895, according to ranges, is shown in the following table. It will be seen that the pioneer Marquette, which has led the column from the beginning, with the single exception of 1892, when the Gogebic alone exceeded it, dropped to third place in 1895, and that the Menominee range came closer to the Marquette output last year than ever before. But for the ten weeks' strike the Marquette range would have shown a considerably larger total, though it is doubtful if its position for the year would have been changed. A supplement accompanying this issue gives the shipments by mines since the opening of the first property in the Lake Superior region.

SHIPMENTS BY RANGE.

Ranges.	1895, Gross tons.	1894, Gross tons.	1893, Gross tons.	1892, Gross tons.
Mesabi.....	2,781,587	1,785,839	613,620	4,245
Gogebic.....	2,547,976	1,834,086	1,329,464	2,971,991
Marquette.....	2,097,838	2,049,107	1,835,893	2,666,856
Menominee.....	1,923,798	1,137,949	1,466,197	2,261,499
Vermillion.....	1,077,838	948,513	820,621	1,167,650
Total.....	10,429,037	7,755,494	6,065,795	9,072,241

SHIPMENTS BY PORTS.

Ports.	1895, Gross tons.	1894, Gross tons.	1893, Gross tons.
Escanaba.....	2,860,172	1,644,770	2,048,981
Ashland.....	2,350,219	1,738,590	1,117,524
Two Harbors.....	2,118,156	1,373,253	903,329
Duluth.....	1,598,783	1,361,043	440,292
Marquette.....	1,079,485	1,424,856	1,093,774
Superior.....	117,884	80,273
Gladstone.....	109,211	79,108	203,585
All-rail.....	194,127	133,874	178,037
Total.....	10,429,037	7,755,494	6,065,795

MARQUETTE RANGE.

Mines	Gross tons	Mines	Gross tons
Blue.....	44,140	Michigamme.....	3,214
Cambria.....	41,656	Negaunee.....	90,682
Champion.....	100,398	Pitts. and Lake Angeline.....	313,555
Cheshire.....	6,593	Platt.....	13,198
Cleveland.....	221,153	Queen.....	160,817
Dexter.....	13,752	Republic.....	174,027
Fitch.....	174	Schadt.....	1,261
Grand Rapids.....	6,764	Star West.....	51,207
Iron Cliffs.....	259,042	Volunteer.....	32,672
Jackson.....	42,186	Winthrop.....	119,120
Lake Superior.....	342,439	Total.....	2,097,838
Lillie.....	54,285		
Mesabi's Friend.....	5,503		

MENOMINEE RANGE.

Antoine.....	27,931	Loretto ..	53,160
Appleton.....	2,107	Mastodon.....	23,733
Aragon.....	183,296	Michigan Exp. Co.....	1,071
Armenia.....	2,045	Millie.....	10,924
Chapin.....	618,589	Penn Iron Mining Co.....	290,622
Columbia.....	70,867	Perkins.....	2,161
Commonwealth.....	208,880	Pewabic.....	262,551
Crystal Falls ..	13,037	Quinnisec.....	761
Dunn.....	90,885	Sheridan.....	16,754
Florence.....	22,820	Youngstown.....	13
Hemlock.....	949	Total.....	1,923,798
Hiawatha.....	1,201		
Keel Ridge.....	19,441		

GOGEBIC RANGE.

Anvil.....	68,064	Newport.....	157,821
Ashland.....	126,096	Norrie.....	738,480
Atlantic.....	70,989	Pabst.....	219,960
Aurora.....	245,883	Palms.....	46,965
Brotherton.....	40,567	Sparta.....	1,950
Cary.....	52,349	Sunday Lake.....	20,970
Davis.....	10,253	Tilden.....	418,188
Eureka.....	26,105	Windsor.....	11,438
Iron Belt.....	148,228	Total.....	2,547,976
Mikado.....	4,788		
Montreal.....	138,882		

VERMILION RANGE.

Chandler.....	605,024	Pioneer.....	40,054
Minnesota.....	432,760	Total.....	1,077,838

MESABI RANGE.

Adams.....	59,141	Mesabi Mountain.....	111,039
Auburn.....	376,970	Mountain Iron.....	305,888
Biwabik.....	247,069	Norman.....	93,392
Canton.....	359,020	North Cincinnati.....	3,046
Cincinnati.....	17,187	Ohio.....	28,943
Fayal.....	136,601	Rathbun.....	95,386
Franklin.....	286,423	Sellers.....	47,433
Hale.....	31,004	Vega.....	47,700
Lake Superior.....	58,123	Total.....	2,781,587
Lone Jack.....	389,338		
Mahoning.....	117,884		

GRAND TOTAL, all ranges, lake and rail 10,429,037

Howden Hot Draft in 26 Lake Steamers.

Some time ago there was presented data and letters to show the efficiency of the Howden hot draft system, which had been applied to the boilers of several steamers by the Detroit Dry Dock Company. This was at a time when the profits in the lake carrying trade were at the minimum. Although many owners were convinced of the economical advantages of the system, the expense of fitting it to their vessels caused them to delay. Notwithstanding this condition sixteen of the better class of steamers on the lakes have been equipped, and ten more will come out next spring with



PIONEER, FITTED WITH HOWDEN HOT DRAFT.

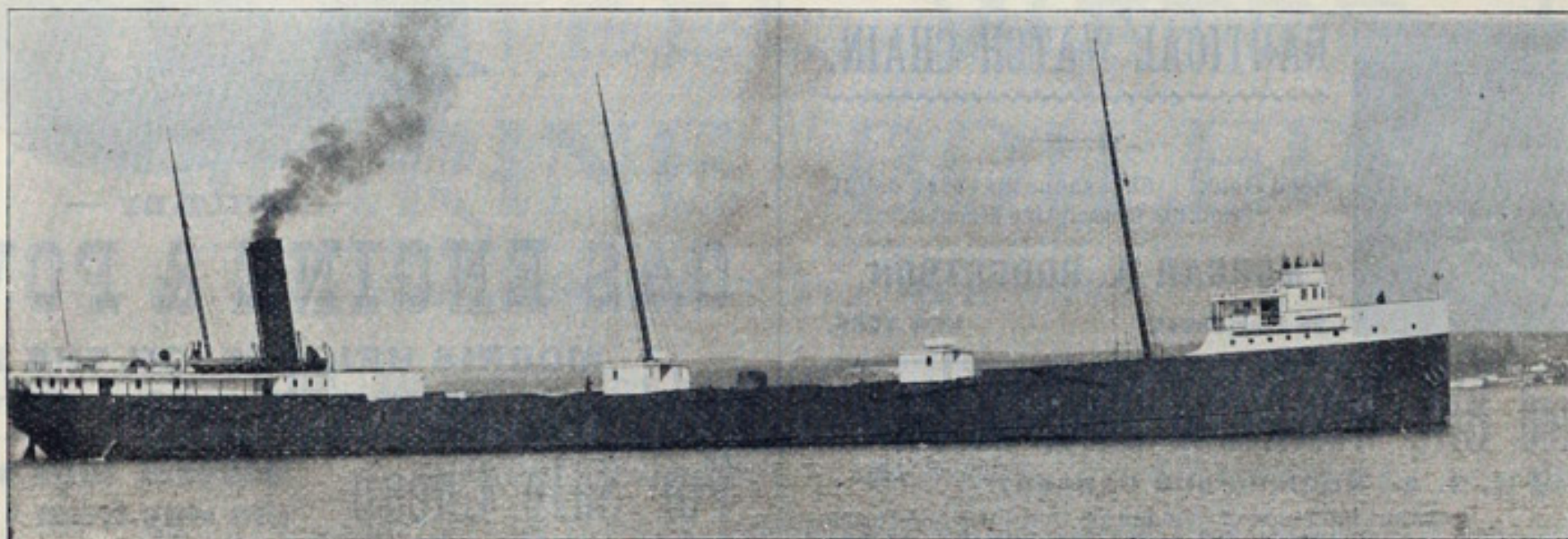
distributing box through which the air under pressure passes into the furnace and over the surface of the fuel. The outer or air-tight door is not exposed to the heat of the furnace, and simply retains the air under pressure entering from the upper valve. The air from this valve, besides filling the space between the doors and passing into the furnace through the inner door, also fills the spaces above the dead-plate around the furnace door, and passes into fixed air-distributing boxes covering the whole surface inside the furnace. In this manner the furnace front castings are preserved from the injurious effects of the great heat of the furnace, while the air entering under pressure is highly heated before being distributed in small jets or streams over the surface of the burning fuel so as to effect complete combustion with the smallest admission of air practicable.

By means of the balance of air pressure above and below the fires all tendency for the fire to blow out at the furnace door, however high the rate of combustion, is entirely removed.

By regulating the admission of the air by the valves above and below the fires the highest rate of combustion possible by the air pressure used can be effected, and in same manner the rate of combustion can be reduced to far below that of natural draft, while complete and economical combustion at all rates is secured.

In usual working at sea, in most recent practice, only one ash pit valve is opened and shut unless the very highest power is required. The upper valve for the air admission over the fires is adjusted at the beginning of the trip to suit the character of the fuel used, and does not require to be afterwards moved during the trip unless the engines are stopped.

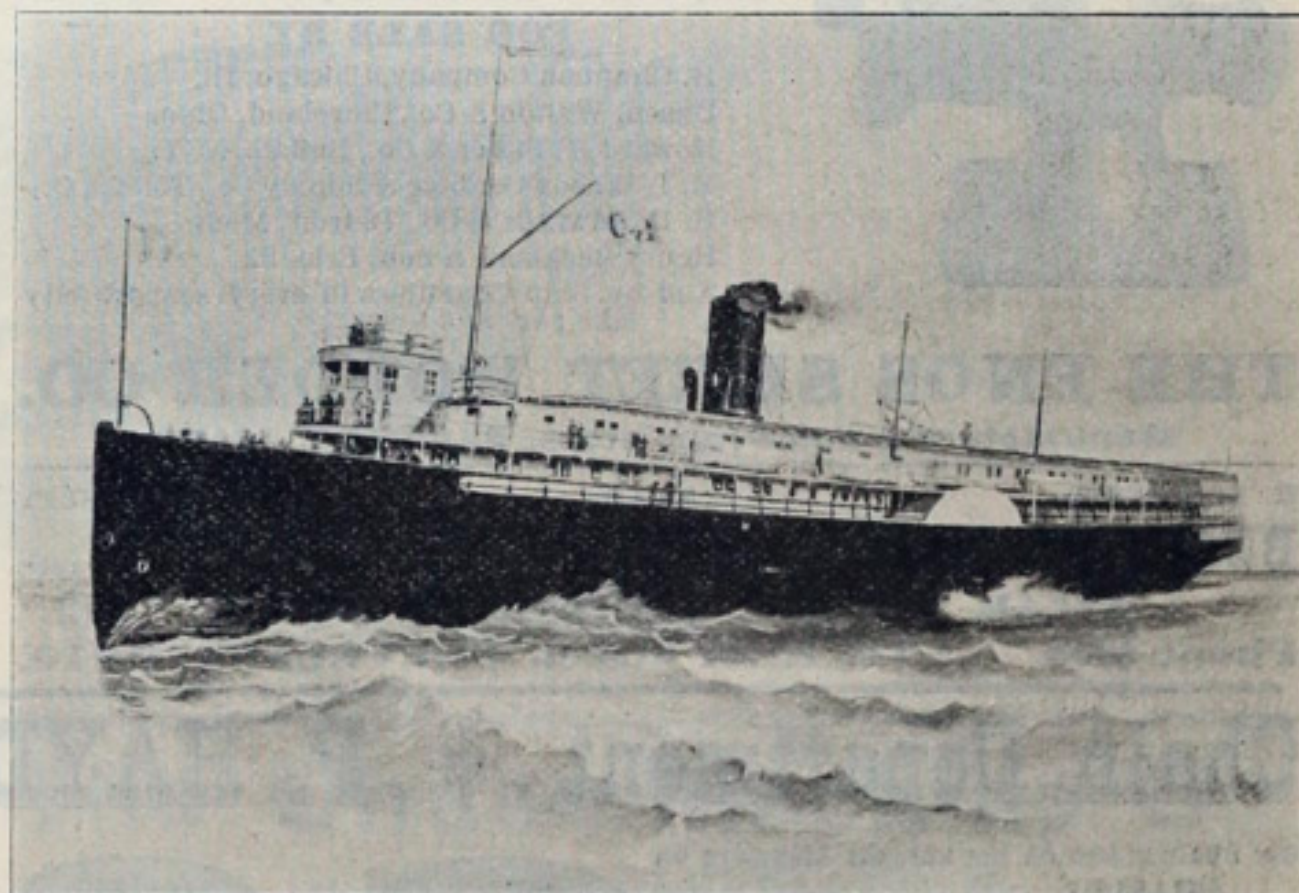
If the combustion is required to be suspended, as in the event of the engines being suddenly stopped when working at full power, all that is necessary is to shut the air admission valves, the upper one being very slightly open to maintain a limited circulation of air through the boxes. Blowing off steam is thus prevented, and the boilers may be kept for hours in this state with the combustion suspended and the steam sustained almost without loss or pressure.



PENOBSCOT, FITTED WITH HOWDEN HOT DRAFT.

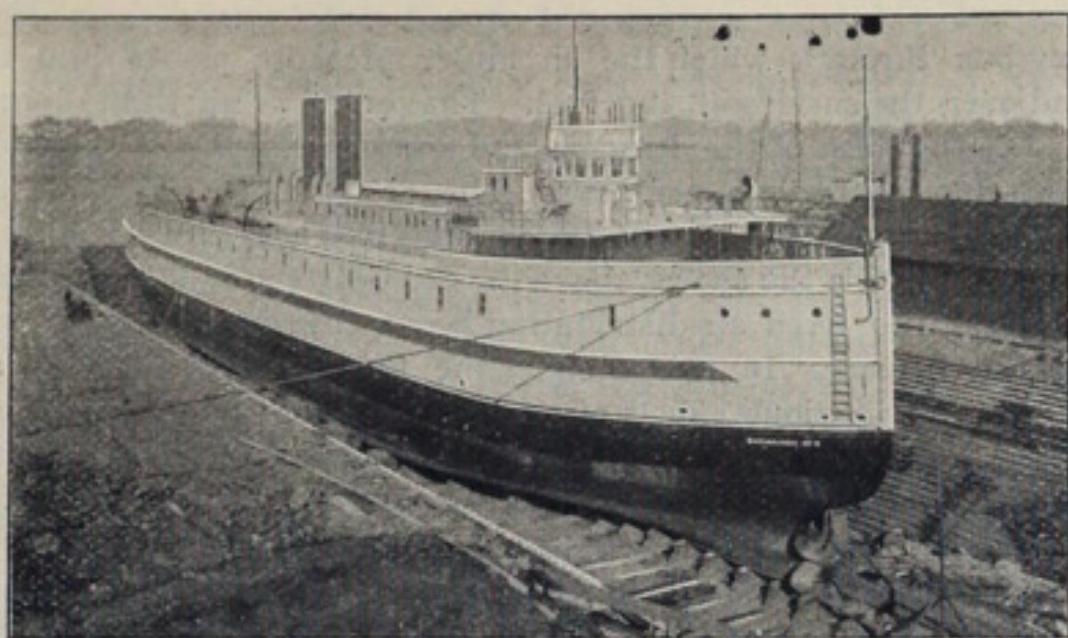
it. The sixteen already equipped are the Virginia, Pioneer, W. B. Ketcham, H. H. Brown, Madagascar, Nicaragua, Argo, Arrow, Rappahannock, Sacramento, Schoolcraft, Pleasure, Penobscot, the City of Alpena, the City of Mackinac and the Chicora. This system of draft is being fitted to the new C. & B. line passenger steamer, two steamers building at Chester, Pa., for the New York and New London trade, the two new steamers building for the Wolverine Steamship Co., and for C. R. Jones & Co. Two of the Rockefeller steamers will have this draft and a comparison with the others of this new fleet will be interesting. Two of the Davidson steamers will also be equipped. He has had experience with it in four other steamers, and is the last man on the lakes who would spend money or adopt a new thing unless it made dollars for him. Owners of the Fayette Brown, S. R. Kirby, R. P. Ranney and A. McVittie have ordered these steamers equipped. There is but very little doubt that the expense of equipping a steamer will be equalled by the saving of coal in two seasons, and then go on making from 33 1/3 to 50 per cent. each season thereafter. The saving is made in two ways. First it is very plain that heating the air that goes into the furnace by the gases that go up the stack saves, and then the draft enables a cheaper quality of coal to be used. Fair profits were made last season and it would be financial wisdom or good horse sense to appropriate some of these profits to securing a coal saving device that will put older steamers on an equal footing in this regard with the steamers coming out next spring.

The Howden system supplies hot air to closed ash pits, resulting in the production of maximum power together with the highest efficiency and economy of fuel. The means by which these objects are attained is by first placing an air-tight reservoir or chamber on the front end of the boiler and surrounding the furnaces. This reservoir, which projects from 8 to 10 inches from the end of the boiler, receives the air under pressure, which is passed by the valves into the ash pits and over the fires in proportions exactly suited to the kind of fuel used and the rate of combustion required. The air used above the fires is admitted by its valve to a space between the outer and inner furnace doors, which swing on one hinge, the inner being the proper door of the furnace, having perforations and an air-



CITY OF BUFFALO, FITTED WITH HOWDEN HOT DRAFT.

This system of draft can be very effectively and economically worked with cold air in consequence of the controlled admissions described rendering the temperature and quantity of the waste gases less than in other modes of working for equal weights of fuel consumed. The most important feature, however, in securing both the highest efficiency and economy is the combination of the heating of the air of combustion by the waste gases with the controlled and regulated admission of air to the furnaces. This arrangement is effected most conveniently by passing the hot fire-gases after they leave the boiler through stacks of vertical tubes enclosed in the up-take, their lower ends being immediately above the smoke-box doors.



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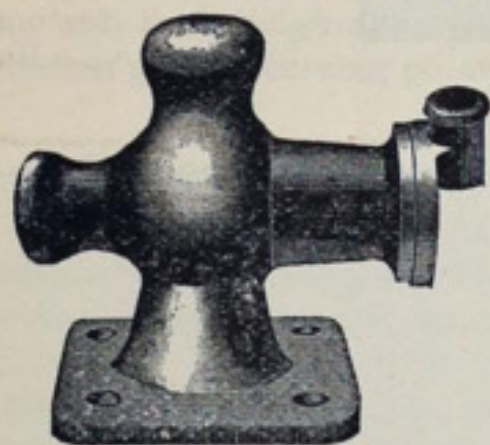
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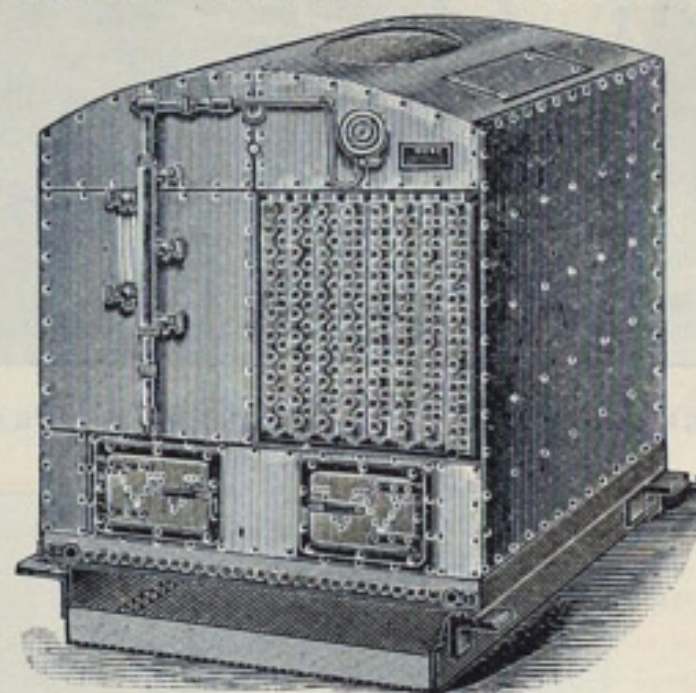
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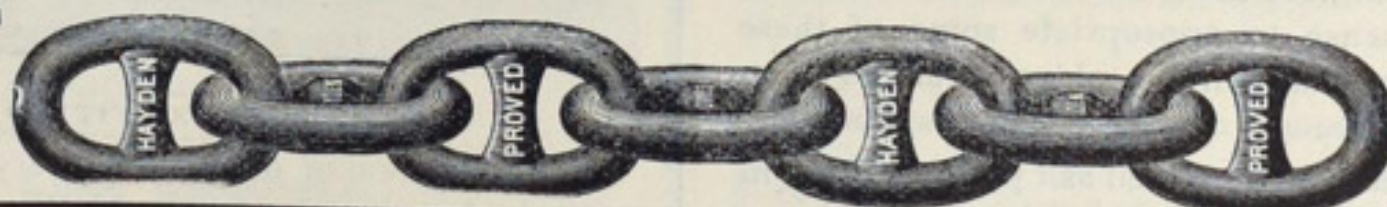
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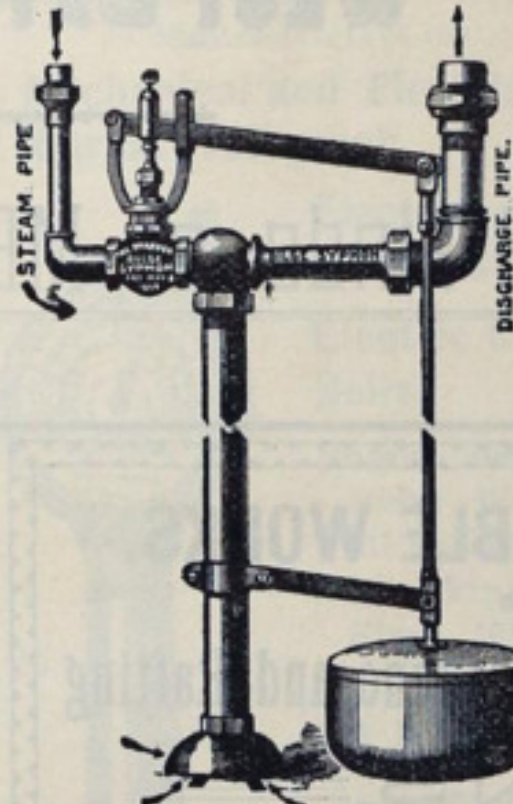


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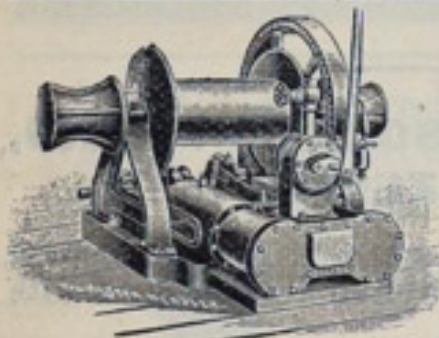
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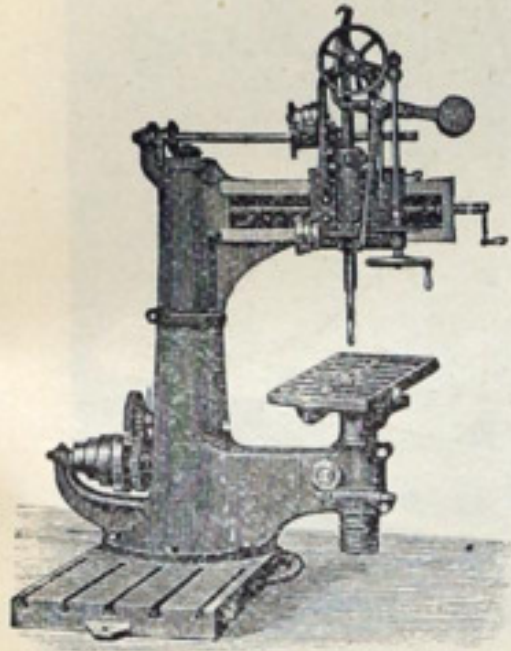
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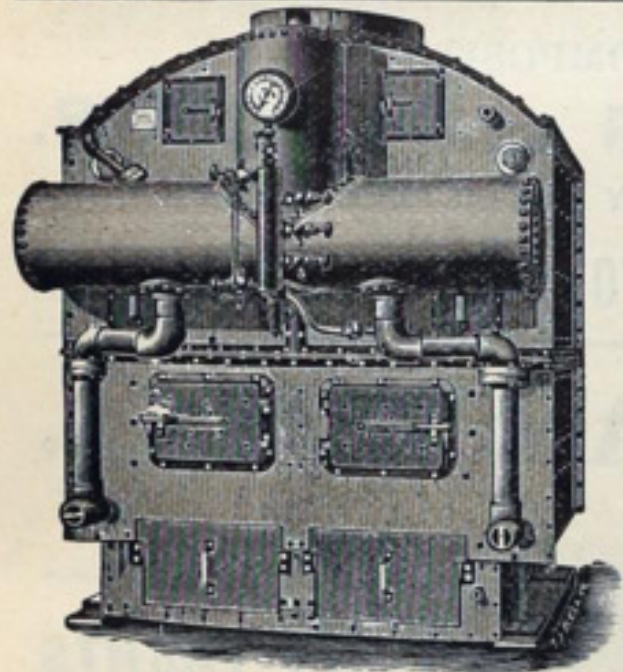
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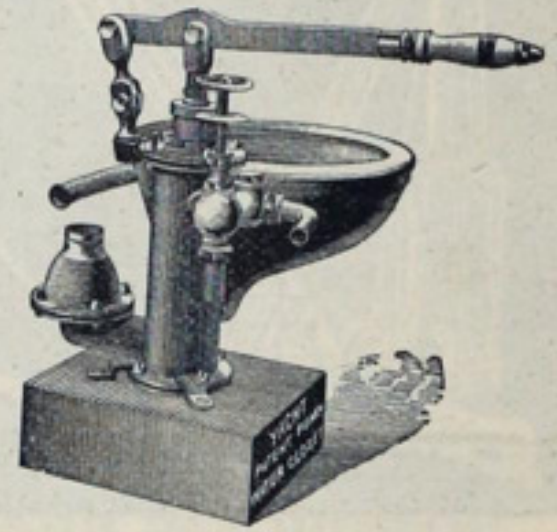


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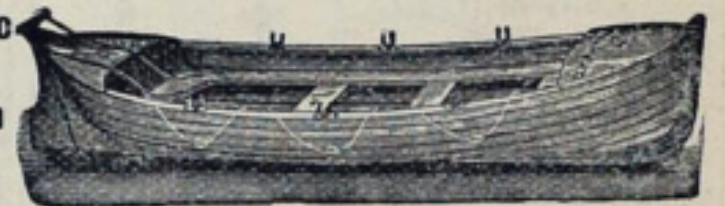
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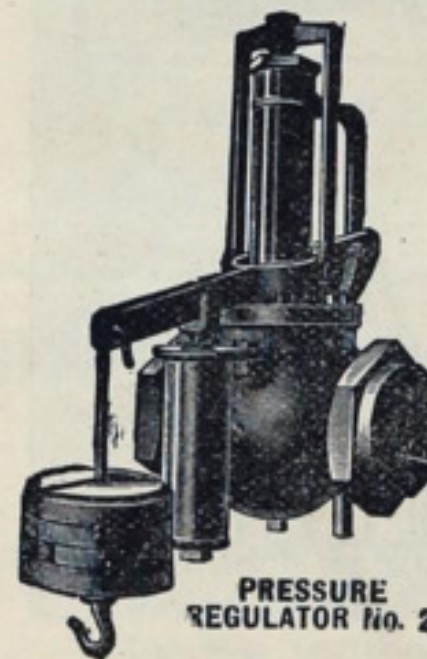
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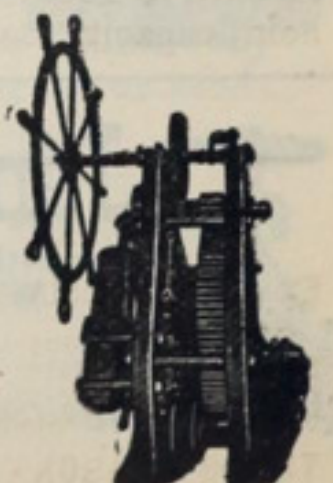
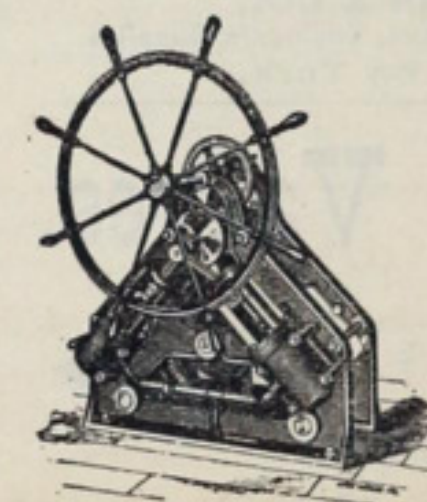
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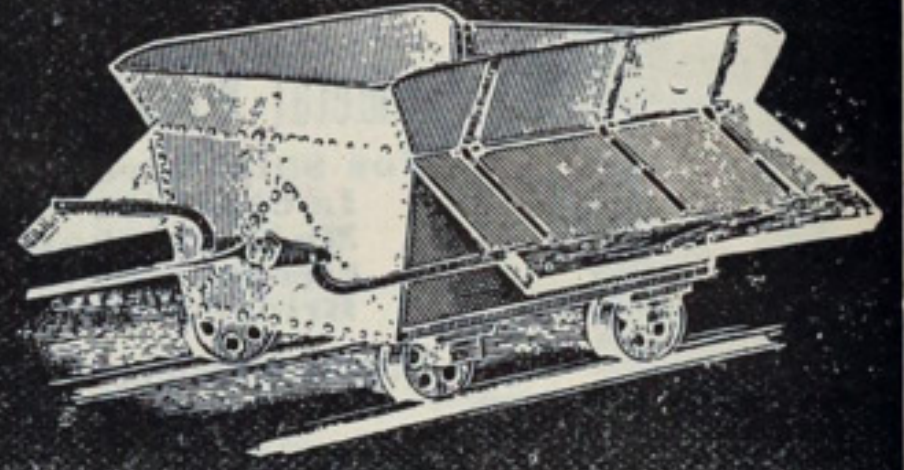
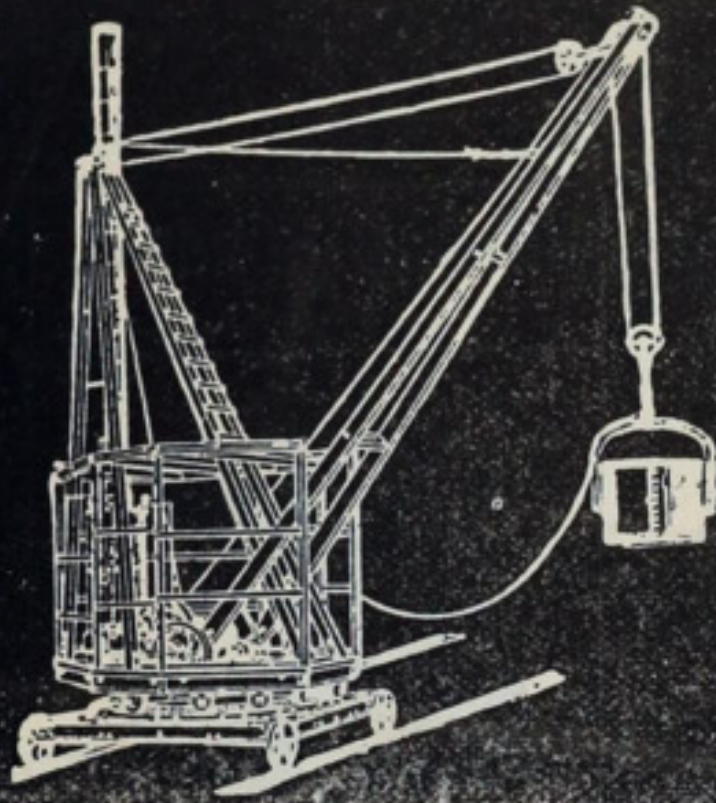
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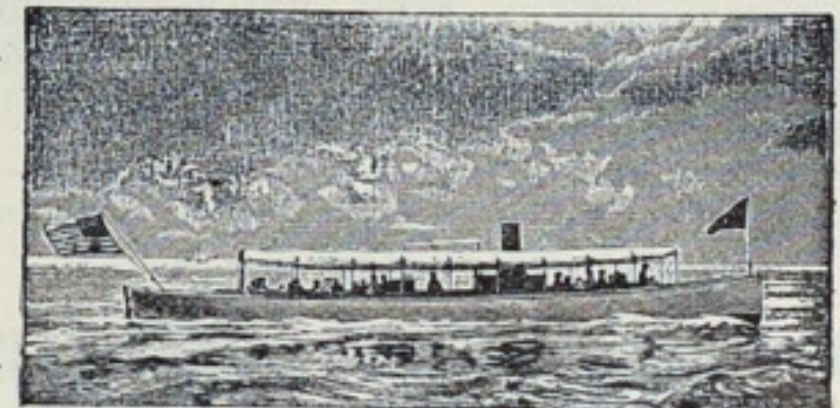
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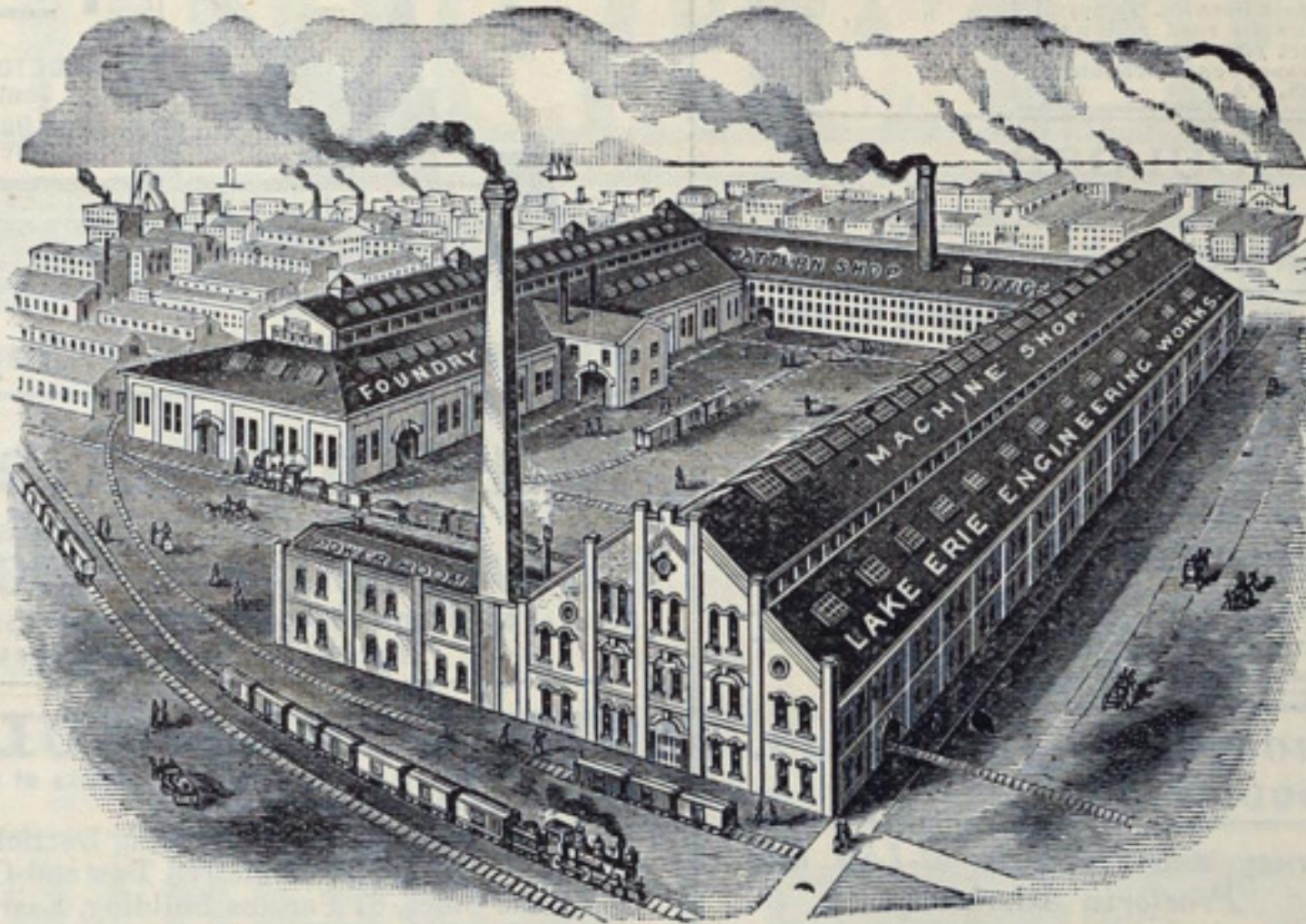
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Buffalo, N. Y.	do	341	349	45	14	14	
Chicago, Ill.	Chicago Ship Building Co. (Calumet)	445	470	70	100	18	
Cleveland, Ohio.	Ship Owners Dry Dock Co.	450	465	50	17	17	Timber. Timber. Graving. Graving. Marine Railway (1,500 tons) also. To be ready June 1.
Cleveland, Ohio.	do	325	340	55	14	14	
Cleveland, Ohio.	Cleveland Dry Dock Co.	340	360	50	88	21	
Detroit, Mich.	Detroit Dry Dock Co.	365	378	79	90	16	Timber. Timber. Graving. Graving. Marine Railway (1,500 tons) also. To be ready June 1.
Detroit, Mich.	do	245	245	48	48	8½	
Port Huron, Mich.	Dunford & Alverson Dry Dock Co.	392	412	62	95	18	
Port Huron, Mich.	do	255	270	50	6	6	Timber. Timber. Graving. Graving. Marine Railway (1,500 tons) also. To be ready June 1.
Toledo, Ohio.	Craig Ship Building Co.	200	250	45	8	8	
Toledo, Ohio.	do	400	425	60	16	16	
West Superior, Wis.	American Steel Barge Co.	554	500		20	20	

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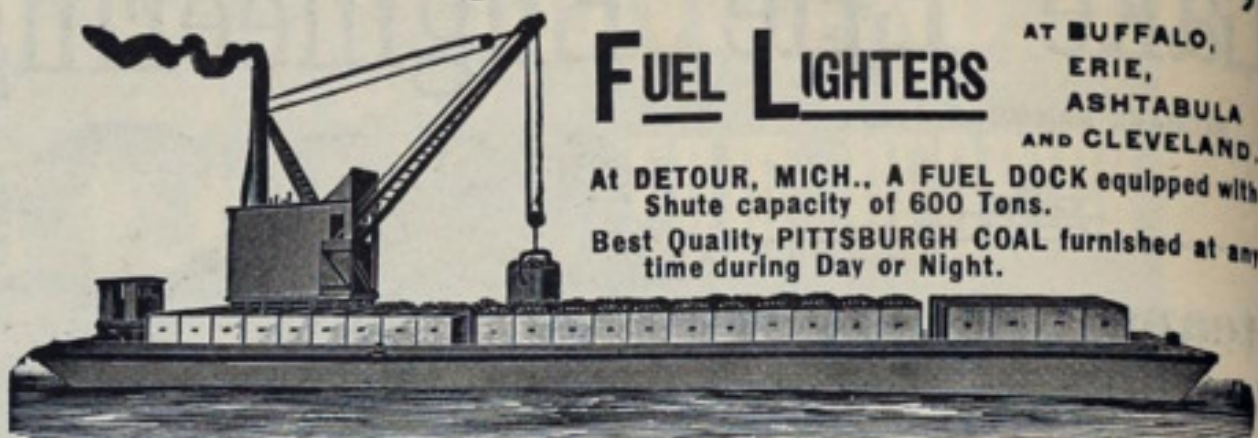
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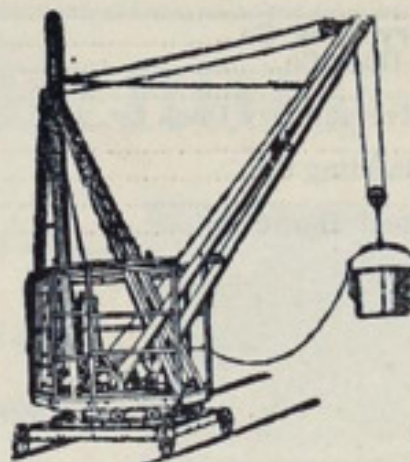
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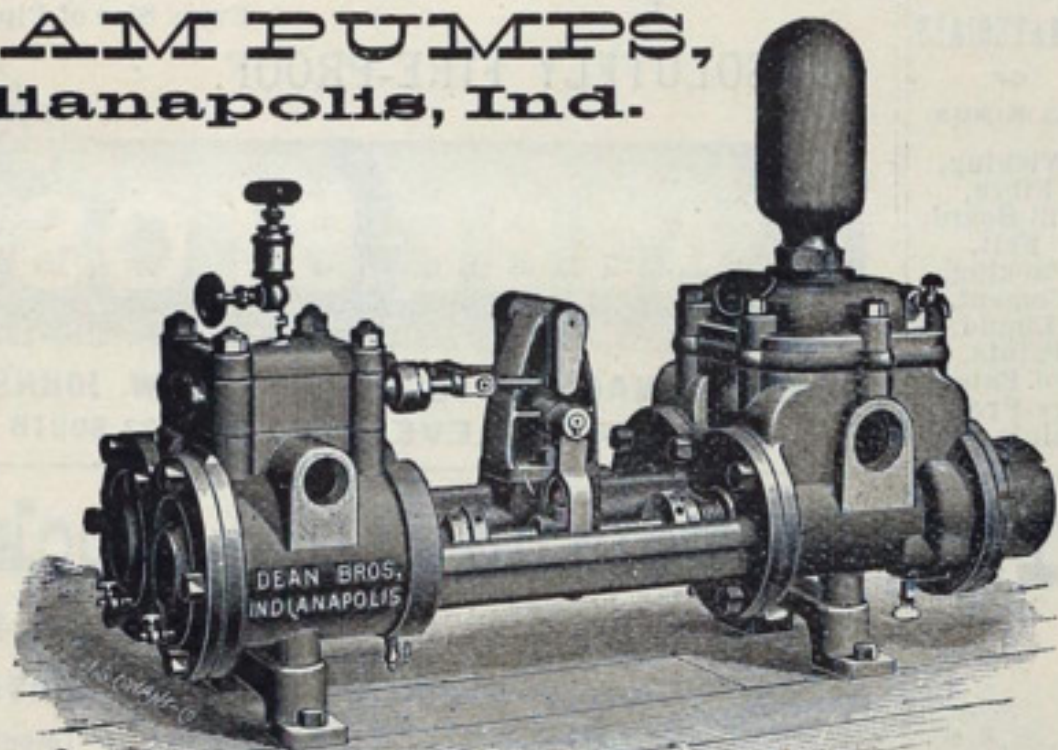
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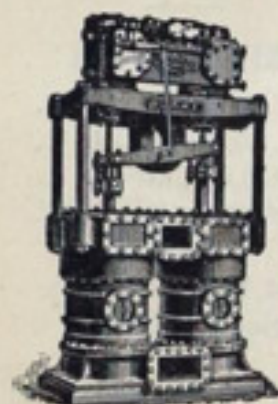
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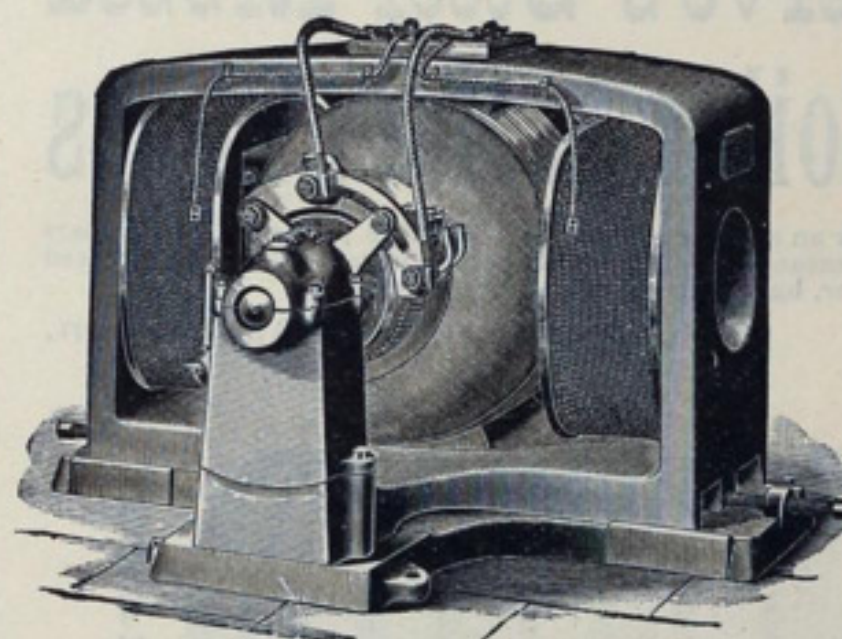
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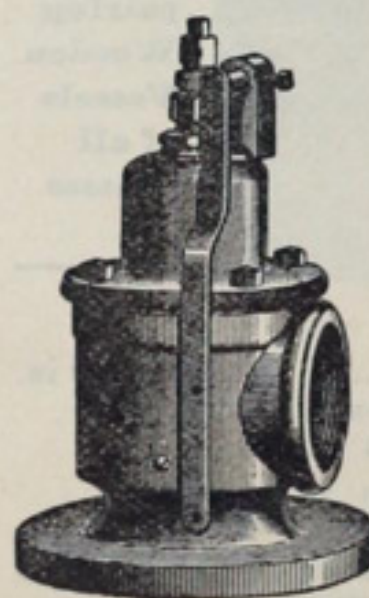
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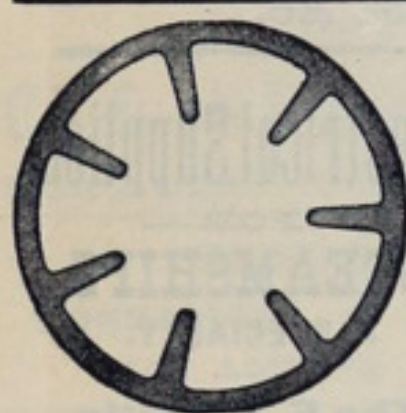
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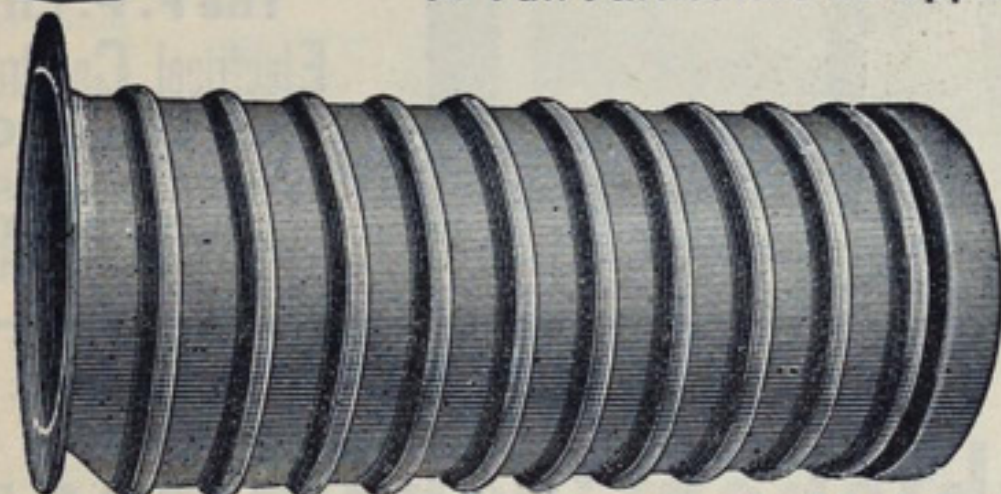
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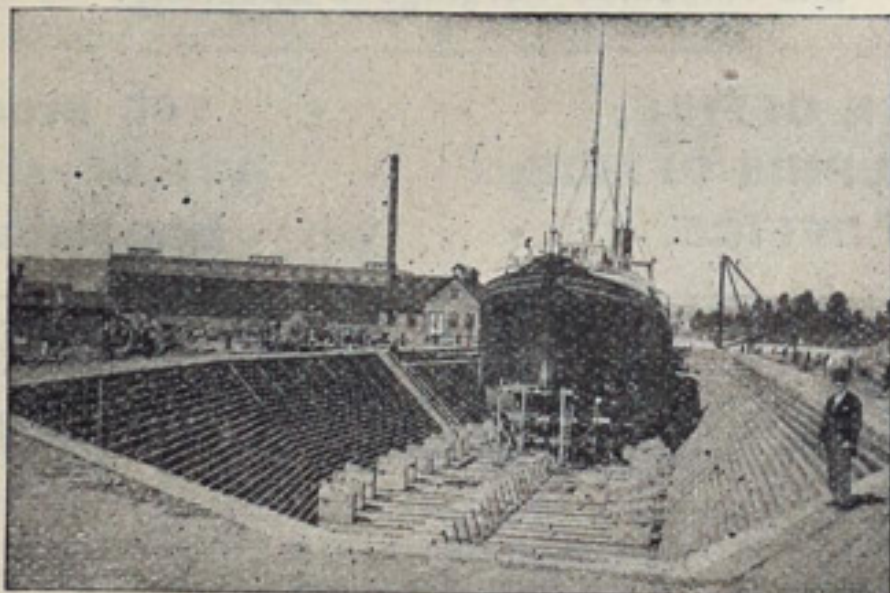
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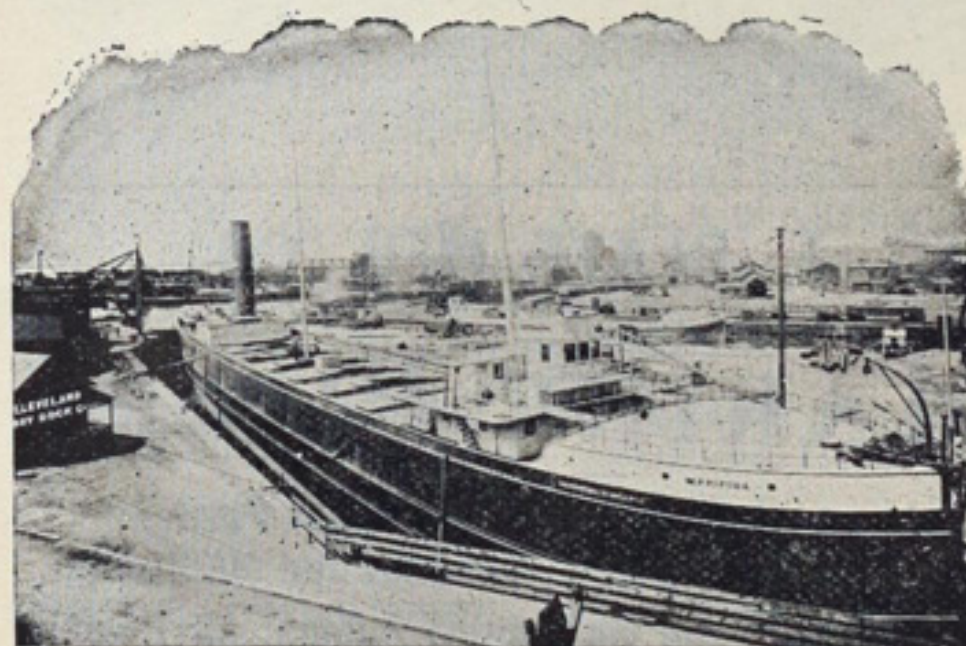
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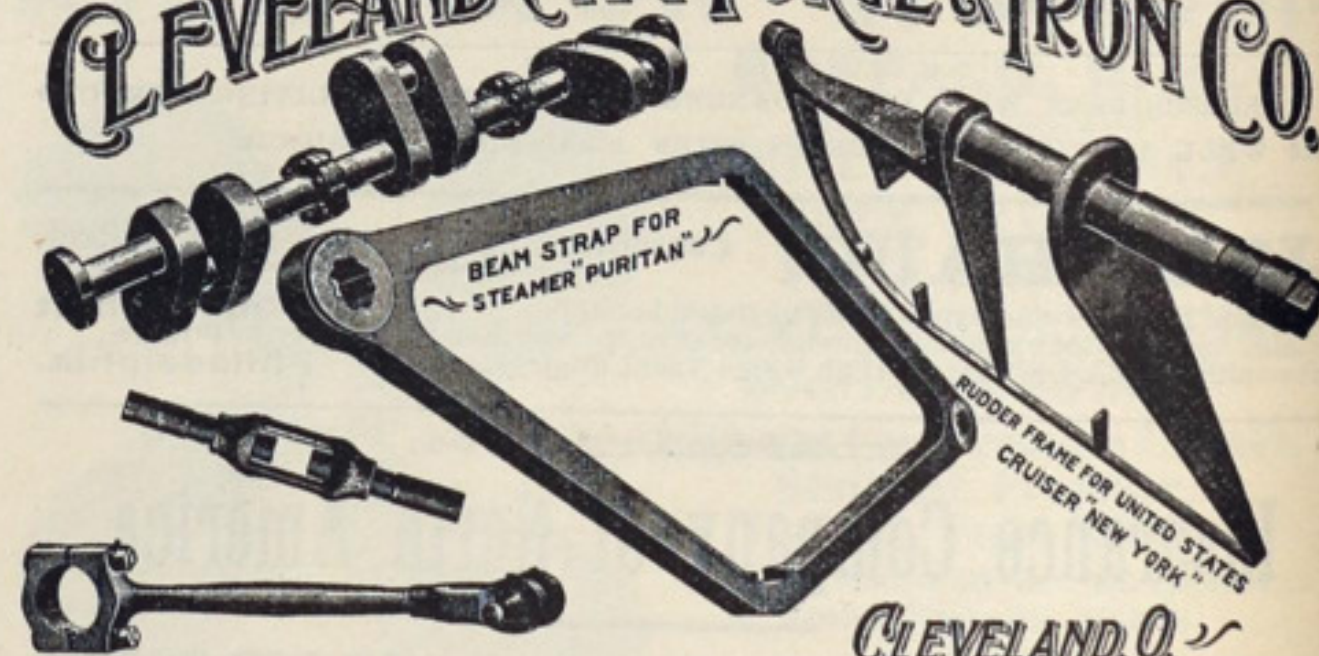
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